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PERCEPÇÃO DAS MUDANÇAS CLIMÁTICAS EM POPULAÇÕES DE PEQUENA ESCALA: MAPEAMENTO SISTEMÁTICO DA LITERATURA E A PERSPECTIVA DO POVO INDÍGENA KHÎSÊTJÊ

SÃO PAULO

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Tese apresentada ao Programa de Pós-Graduação em Ciência Ambiental do Instituto de Energia e Ambiente da Universidade de São Paulo para obtenção do título de Doutor em Ciência Ambiental.

Orientadora: Profa. Dra. Carla Morsello

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Dedico esta tese ao povo indígena Khĩsêtjê, aos meus ancestrais e a todos os povos indígenas.

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“Somos alertados o tempo todo para as consequências dessas escolhas recentes que fizemos. E se pudermos dar atenção a alguma visão que escape a essa cegueira que estamos vivendo no mundo todo, talvez ela possa abrir nossa mente para alguma cooperação entre os povos, não para salvar os outros, para salvar a nós mesmos” (KRENAK, 2019, p.44)

RESUMO

TRONCARELLI, L. T. **Percepção das mudanças climáticas em populações de pequena escala: mapeamento sistemático da literatura e a perspectiva do povo indígena Khĩsêtjê**. 2023. 532 f. Tese (Doutorado em Ciências Ambientais) – Instituto de Energia e Ambiente, Universidade de São Paulo, São Paulo, 2023.

As mudanças climáticas já afetam populações de pequena escala em todo o mundo. Maior risco nessas populações deriva da alta dependência direta de recursos naturais para a própria subsistência, baixa capacidade de lidar com eventos extremos devido à pobreza e vulnerabilidade, além de baixo acesso à infraestrutura. Para tomarem medidas de adaptação frente a tal contexto, essas populações precisam, primeiro, perceber as mudanças climáticas. Assim, a literatura sobre este tema é vasta, muito embora seja difícil comparar os estudos para entender quais fatores modulam a percepção das pessoas. A razão principal é que os artigos científicos adotam conceitos alternativos de percepção das mudanças climáticas, sem explicitar quais destes são importantes. Segundo, nem sempre a percepção das pessoas reflete o que ocorre de fato, pois esta é afetada por fatores diversos, por exemplo, crenças, diferentes visões de mundo ou conhecimento tradicional. Partindo deste contexto, esta tese teve dois objetivos principais. No primeiro capítulo, o objetivo consistiu em identificar como o conceito de percepção varia na literatura científica sobre mudanças climáticas em populações de pequena escala. Para tal, o estudo se baseou em um mapeamento sistemático da literatura publicada de 2018 a 2022 em cinco bases eletrônicas de dados, seguindo as diretrizes do *Collaboration for Environmental Evidence*. Após a triagem de 5.358 artigos, foram mantidos 361 artigos que cumpriram os critérios de elegibilidade definidos previamente. Deste total, os resultados mostraram que as definições são interdisciplinares. Somente 20% dos artigos continham alguma definição explícita do conceito de percepção, enquanto todos incluíam ao menos dois constructos de percepção, variando entre consciência, conhecimento tradicional, experiência direta e indireta, dentre outros. O segundo capítulo teve o objetivo de entender: (i) a percepção de indivíduos do povo indígena Khĩsêtjê, da Amazônia brasileira, sobre as mudanças climáticas locais, suas causas e consequências para os modos de vida.; (ii) até que ponto essa percepção individual está alinhada ao conhecimento climático para a Amazônia, e (iii) quais estratégias de adaptação estão sendo adotadas por eles. Neste capítulo, os dados foram coletados em delineamento

observacional transversal, por meio de *survey* por entrevistas estruturadas presenciais em agosto de 2019, com amostra não probabilística de indivíduos da comunidade Khĩkatxi (n=109). Os resultados indicam que os Khĩsêtjê percebem a ocorrência de mudanças climáticas, atribuindo-lhes causas humanas, como mudanças graduais nas temperaturas e precipitações, aumento de raios e na intensidade de ventos, transformações na flora e fauna da região. Além da experiência direta, a percepção dos Khĩsêtjê provém de diferentes fontes de informação, inclusive o conhecimento tradicional utilizado em previsões de curto prazo (dias/semanas) para antever: (i) o período das épocas de seca e chuva; (ii) o início das chuvas, período ideal para o plantio de mandioca no roçado. Algumas estratégias de adaptação vêm sendo implementadas, embora 90% dos entrevistados não se sintam preparados para enfrentar as mudanças climáticas. Entre as conclusões de cada capítulo, duas se destacam. Primeiro, o aprofundamento sobre o que é o conceito de percepção é necessário, tanto em termos teóricos, quanto em termos da prática com populações de pequena escala. Segundo, conhecer a percepção de populações de pequena escala auxilia os pesquisadores e a própria população a entenderem quais são as prioridades e preocupações climáticas dessas comunidades, integrando o conhecimento local ao científico, garantindo uma maior funcionalidade de estratégias de adaptação adequadas ao contexto e necessidades dessas populações.

Palavras-chave: Conhecimento tradicional. Crença. Consciência. Experiência. Indicador tradicional. Mudanças globais. Observação direta. Percepção de Risco. Populações tradicionais. Variabilidade climática.

ABSTRACT

TRONCARELLI, L. T. **Perception of climate change in small-scale populations: systematic mapping of the literature and the perspective of the Khĩsêtjê indigenous people**. 2023. 532 f. Tese (Doutorado em Ciências Ambientais) – Instituto de Energia e Ambiente, Universidade de São Paulo, São Paulo, 2023.

Climate change already affects small-scale populations worldwide. Higher risk in these populations derives from direct dependence on natural resources for subsistence, low capability to deal with extreme events due to poverty and vulnerability, and limited access to infrastructure. To adapt, these populations need, first, to perceive climate change. Accordingly, there are many studies about people's perceptions in the literature, but they are difficult to compare to understand which factors contribute the most. The main reason is that scientific articles adopt alternative concepts of climate change perception, without specifying which are essential. People's perceptions do not always reflect reality due to the influence of beliefs, worldviews, and traditional knowledge. Based on this context, this thesis focused on two objectives. In the first chapter, we identified how the concept of perception varies in the scientific literature on climate change about small-scale populations. To this end, we adopted a systematic mapping of the published literature from 2018 to 2022 in five electronic databases, following the Collaboration for Environmental Evidence guidelines. After screening 5,358 articles, 361 that met the previously defined eligibility criteria, were selected. The results showed that the definitions are interdisciplinary. Only 20% contained an explicit definition of perception, whereas all articles presented at least two perception constructs, varying mainly among awareness, traditional knowledge, and direct or indirect experience. The second chapter aimed to understand: (i) the perceptions of local climate changes by the Brazilian Amazon Khĩsêtjê, and the consequences to their livelihoods; and (ii) to what extent Khĩsêtjê's perceptions align with climate knowledge for the Amazon, besides the strategies for climate change adaptation. In this latter case, data came from a cross-sectional observational design through face-to-face survey interviews in August 2019 with a non-probabilistic sample of individuals from the Khĩkatxi community (n=109). The results indicate that the Khĩsêtjê perceive climate changes, attributing human causes to them. Specifically, they reported gradual increases in temperatures, changes in precipitation levels, increases in both lightnings and wind intensity, and changes in flora and fauna.

In addition to direct experience, perceptions come from different sources of information, including traditional knowledge adopted in short-term forecasts (days/weeks) to anticipate: (i) the period of dry and rainy seasons; (ii) the ideal moment for planting cassava. Some adaptation strategies have already been implemented, yet 90% of respondents feel unprepared to confront climate change. To conclude, this thesis demonstrates that, first, more cautious use of the perception concept is necessary for theoretical studies and climate adaptation practice among small-scale populations. Second, an improved understanding of small-scalers' perceptions helps researchers and these populations understand better the climate change priorities and which are the primary concerns, ensuring greater functionality of adaptation strategies.

Keywords: Awareness. Belief. Climate variability. Direct observation. Experience. Global changes. Smallholders. Small-scale population. Risk perception. Traditional indicator. Traditional knowledge.

LISTA DE MAPAS

LISTA DE TABELAS

LISTA DE FIGURAS

LISTA DE ABREVIATURAS E SIGLAS

AIK - Associação Indígena Khĩsêtjê

CEE - *Collaboration for Environmental Evidence*

CEP –Comitê de Ética em Pesquisa

CH_4 - Metano

CO_2 - Dióxido de carbono

CONEP – Comissão Nacional de Ética em Pesquisa

FUNAI - Fundação Nacional dos Povos Indígenas

GEE – Gases de efeito estufa

IBAMA - Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis

IPCC – Painel Intergovernamental sobre Mudanças Climáticas (*Intergovernmental Panel on Climate Change)*

INMET – Instituto Nacional de Meteorologia

Km^2 - Quilômetro quadrado

MC – Mudanças climáticas

mm - Milímetros

N_2O – Óxido nitroso

ONG – Organização não-governamental

ONU – Organização das Nações Unidas

PFNMs - Produtos florestais não-madeireiros

P.I.X. – Parque Indígena do Xingu

RDS – Reserva de de Desenvolvimento Sustentável

RESEX – Reserva Extrativista

ROSES - *Reporting standards for Systematic Evidence*

T.I. – Terra Indígena

T.Is – Terras Indígenas

T.I.P.I.X. – Terra Indígena Parque do Xingu

UBSI - Unidade Básica de Saúde Indígena

WoS - *Web of Science Core Collection*

SUMÁRIO

INTRODUÇÃO GERAL

Populações de pequena escala ao redor do mundo já vêm sendo afetadas pelas mudanças climáticas (MC) (IPCC, 2022). Os impactos sofridos são, contudo, desiguais, pois o impacto atual ou futuro depende da localização geográfica, condições socioeconômicas, contextos culturais e locais específicos de cada região (REYES-GARCÍA *et al.*, 2023), além de caraterísticas dos indivíduos como, por exemplo, o gênero (BALEHEY; TESFAY; BALEHEGN, 2018; EASTIN, 2018; PANDEY, 2020; SINGH *et al.*, 2017). O nível de pobreza é particularmente importante nesse caso, pois indivíduos mais pobres terão menos condições de enfrentarem sozinhos os impactos negativos de desastres climáticos (KRONIK; VERNER, 2010). A razão é que populações de pequena escala usualmente carecem dos recursos financeiros e meios necessários para se adaptarem, além da pobreza estar, em geral, associada à deficiência de acesso a informações, como aquelas sobre a situação climática, os desastres potenciais e o que fazer nessas situações (WORLD BANK, 2015).

A literatura científica aponta que existem três aspectos principais dos modos de vida de populações de pequena escala que já vêm sendo afetados negativamente pelas MC[1]: (i) a saúde e o bem-estar (ELLIS; ALBRECHT, 2017; MIDDLETON *et al.*, 2020b; SAKAKIBARA, 2009), (ii) as atividades econômicas de subsistência ou que são utilizadas como fontes de renda monetária (ARYAL; COCKFIELD; MARASENI, 2014; BOISSIÈRE *et al.*, 2013; BRINKMAN *et al.*, 2022; DEBELA *et al.*, 2015; NEGI *et al.*, 2021; NEGI, 2016) e, por fim, (iii) a interação entre estas duas últimas, como no caso das consequências para a segurança alimentar (FAO, 2015; KARKI *et al.*, 2021; OGUNDEJI, 2022; ROY *et al.*, 2022).

Piora em aspectos da saúde e do bem-estar de populações de pequena escala são o primeiro impacto negativo apontado por alguns estudos como decorrência das MC em curso. É o caso tanto do aumento na incidência de problemas psicológicos (e.g., depressão, ansiedade, suicídio, dependência de álcool e outras drogas) (LEBEL *et al.*, 2022; MIDDLETON *et al.*, 2020b, 2020a; WILLOX *et al.*, 2015), como de problemas físicos (e.g., doenças respiratórias e estomacais), por vezes causados por doenças infeciosas como malária (BERRANG-FORD *et al.*, 2012) ou dengue (AHMED; ATIQUL HAQ, 2019).

[1] As MC não acontecem isoladamente, mas sim interagem com outros aspectos dos modos de vida. Portanto, as MC exacerbam outras vulnerabilidades que já existem, como a opressão histórica vivida pelos povos indígenas.

Essencial à manutenção dos modos de vida de populações de pequena escala, o segundo aspecto que sofre efeitos negativos é a economia dessas populações, tanto em termos da subsistência (i.e. produção e extração para o próprio consumo), como da geração de renda monetária. Evidências de que as MC afetam tais atividades já foram observadas e descritas em diversos locais do mundo, como na agricultura (AHMAD; YASEEN; SAQIB, 2022; AYANLADE; RADENY; MORTON, 2017; BAUER; DE JONG; INGRAM, 2022; GHOSH-JERATH *et al.*, 2021; LASTRA LANDA; GRADOS BUENO, 2022; MARTÍNEZ-HERRERA *et al.*, 2021), caça (BODMER *et al.*, 2018; HERMAN-MERCER *et al.*, 2019; MAPFUMO; MTAMBANENGWE; CHIKOWO, 2016), pesca (LASTRA LANDA; GRADOS BUENO, 2022; MARTIN; PARLEE; NEYELLE, 2020; RAMÍREZ; IBARRA, 2019; SALVADEO *et al.*, 2021; VASCONCELOS *et al.*, 2022), atividades pastoris (CUNI-SANCHEZ *et al.*, 2019; MIARA *et al.*, 2022) e coleta de produtos florestais (BAUER; DE JONG; INGRAM, 2022; ESTEVO *et al.*, 2022; GURUNG *et al.*, 2021a, 2021b)

Por fim, a interação entre saúde e atividades econômicas de subsistência são o terceiro aspecto que já vem sofrendo os efeitos negativos das MC. É o caso da segurança alimentar de populações de pequena escala, pois as MC têm provocado escassez de alimentos (BELAY *et al.*, 2022), reduzindo o acesso, a qualidade, quantidade e/ou diversidade dos recursos alimentares disponíveis a populações de pequena escala (HARVEY *et al.*, 2018; LEONARD, 2022; LINCOLN LENDERKING; ROBINSON; CARLSON, 2021; SHISANYA; MAFONGOYA, 2016).

Posto que as populações de pequena escala vêm sendo afetadas pelas MC, as percepções sobre o que está acontecendo em seus modos de vida, tanto das próprias populações quanto por parte dos pesquisadores, são importantes por razões científicas e pragmáticas.

Do ponto de vista científico, o número e a variedade de localidades geográficas têm aumentado nos estudos sobre percepção das MC em populações de pequena escala (FIERROS-GONZÁLEZ; LÓPEZ-FELDMAN, 2021; MADHURI; SHARMA, 2020; REYES-GARCÍA *et al.*, 2016; SAVO *et al.*, 2016). Esses estudos têm variado em suas áreas temáticas, constructos de percepção utilizados, forma de apresentação do conceito de percepção (explícita *versus* implícita), modos de economia de subsistência e tipo de população de pequena escala investigada. Uma característica muito comum nesses estudos é a ausência de clareza sobre qual o conceito de percepção está sendo adotado (TRONCARELLI; MORSELLO, 2022). Essa limitação é problemática, pois estudar a percepção em diferentes populações de pequena escala é importante

por várias razões. Primeiro, pode contribuir com informações qualitativas relevantes às análises climatológicas em localidades ignoradas ou sem análises de ocorrências de fenômenos meteorológicos (MARIN, 2010; SAVO *et al.*, 2016). Também fornece dados em escalas espaciais menores, detalhando-as em nível local (MARIN, 2010) e permite a comparação dos efeitos da percepção entre estudos, quando o conceito adotado se refere ao mesmo entendimento sobre o que é percepção. Por fim, compreender o papel das percepções é importante para auxiliar no entendimento: (i) se as mudanças que as populações estão percebendo são de fato alterações climáticas ou não (KALANDA-JOSHUA *et al.*, 2011); (ii) de evidências de mudanças encontradas no território, nos modos de vida, nas condições climáticas, na fauna e na flora local para a própria população (SÁNCHEZ-CORTÉS; CHAVERO, 2011).

Além da contribuição científica, o contexto pragmático atual multiplica a necessidade de investigar quais aspectos são necessários para que as populações de pequena escala lidem e enfrentem os efeitos adversos das MC em seus modos de vida. Para isso, em primeiro lugar, é necessário que as populações de pequena escala, assim como outras partes interessadas, entendam o que são as MC e o que muda em suas atividades de subsistência com a ocorrência das MC (MANH; AHMAD, 2021). A razão é que somente quando os indivíduos percebem as MC, eles podem ter condições[2] de se adaptarem a elas (MADDISON, 2007), ou seja, permite que os indivíduos alterem comportamentos inadequados ao novo contexto e busquem as informações necessárias para a tomada de decisões (SWAMI; PARTHASARATHY, 2020). A percepção pode também favorecer que essas populações tenham protagonismo em lidar com as MC (FORD *et al.*, 2020) e tende a fomentar o desenvolvimento de políticas de enfrentamento do problema, tanto pela própria população, quanto por outros tomadores de decisão como, por exemplo, governos (ALAM; ALAM; MUSHTAQ, 2017).

Apesar de sua importância, o conceito de "perceber" pode ter diversos sentidos como, por exemplo, através do conhecimento tradicional (ORLOVE *et al.*, 2010; ORLOVE; CHIANG; CANE, 2002; UBISI; KOLANISI; JIRI, 2020), da experiência com eventos climáticos através da prática de atividades de subsistência (SÁNCHEZ-CORTÉS; CHAVERO, 2011), da observação de

[2] Quanto às condições para se adaptarem às MC, duas ponderações são necessárias: (i) o cenário onde o indivíduo e/ou comunidade pertence deve ter recursos financeiros e tecnológicos para o investimento em estratégias de adaptação pois, caso contrário, o indivíduo pode perceber as MC e não ter condições de se adaptar a ela; (ii) o investimento em estratégias de adaptação pode ocorrer antes mesmo do indivíduo perceber as MC (e.g., adotando medidas de mitigação).

parâmetros climáticos (BOILLAT; BERKES, 2013; RANKOANA, 2016; SHERPA, 2023) e de eventos climáticos extremos (CODJOE; OWUSU; BURKETT, 2014; PHAM; NONG; GARSCHAGEN, 2021), dentre outras possibilidades. Apesar disso, ainda não está claro na literatura quais conotações de percepção são importantes aos diversos aspectos dos efeitos e ações frente às MC.

Portanto, esta tese teve dois objetivos principais: (i) identificar como o conceito de percepção varia na literatura científica sobre MC em populações de pequena escala, e (ii) entender a percepção de indivíduos do povo indígena Khĩsêtjê, da Amazônia brasileira, sobre as MC e quais as possibilidades iniciais de adaptação[3] às mudanças.

Para isso, além desta Introdução geral, a tese está estruturada em dois capítulos autocontidos e Considerações finais. Sendo assim, cada capítulo contém resumo, introdução, métodos, resultados, discussão e conclusões próprias.

O capítulo I teve por objetivo identificar, classificar e descrever as evidências disponíveis sobre os vários conceitos adotados pela literatura científica para se referir às percepções das MC em populações de pequena escala. Para tal, foi realizado um mapeamento sistemático de 2018 a 2022 em cinco bases de dados eletrônicas de publicações científicas, seguindo critérios de elegibilidade pré-definidos. Após triagem de 5.358 artigos, foram identificados 361 para leitura na íntegra. Conclui-se que os conceitos de percepção adotados nesses artigos são interdisciplinares. Conceitos explícitos foram apresentados somente em 20% dos artigos e definições implícitas de percepção com constructos diversos foram encontradas em todos os artigos. O aprofundamento sobre o conceito de percepção é necessário, pois a sua ausência pode levar a conclusões errôneas e a estratégias de adaptação limitadas às MC pelas populações de pequena escala.

O capítulo II teve o objetivo geral de entender: (i) a percepção sobre as MC em uma população indígena; (ii) até que ponto essa percepção individual está alinhada ao conhecimento climático para a Amazônia, e (iii) quais estratégias de adaptação estão sendo adotadas por essa população. Para tal, o capítulo se baseou no povo indígena Khĩsêtjê, uma sociedade indígena de pequena escala habitante da Amazônia brasileira. O delineamento foi observacional do tipo transversal, aplicando *survey* por entrevistas estruturadas presenciais em agosto de 2019 com indivíduos da aldeia Khĩkatxi (n=109), seguindo uma amostragem não probabilística. As

[3] Compreende-se que a adaptação é um processo que requer mudanças ao longo de décadas e muitas vezes as estratégias adaptativas não são perceptíveis em um primeiro momento pela população local. Portanto, a pesquisadora compreende e ressalta a necessidade de mais estudos sobre este tema entre os Khĩsêtjê.

entrevistas mostraram que os Khĩsêtjê estão percebendo a ocorrência das MC. Eles percebem mudanças graduais na temperatura, precipitação, quantidade de raios e intensidade de ventos, mudanças na flora e fauna da região e têm percebido alguns eventos inusitados que aconteceram na aldeia nas últimas décadas. Algumas das percepções estão alinhadas ao esperado para a Amazônia e, embora eles já estejam implementando algumas estratégias de adaptação, quase todos os entrevistados não se sentem preparados para lidar com as MC.

As considerações finais apresentam as contribuições teóricas e pragmáticas da tese, assim como sugestões futuras de estudos. Por fim, os apêndices apresentam todo o material suplementar aos capítulos, como as autorizações de pesquisa, o protocolo das entrevistas e do mapeamento e a lista de artigos utilizados no mapeamento do primeiro capítulo (i.e. artigos excluídos e selecionados).

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CAPÍTULO I - EVIDÊNCIAS RECENTES DO CONCEITO DE PERCEPÇÃO EM MUDANÇAS CLIMÁTICAS EM POPULAÇÕES DE PEQUENA ESCALA[4]

RESUMO

Background: As mudanças climáticas estão afetando populações de pequena escala em todo o mundo. Evidências de efeitos adversos foram relatadas para a agricultura de pequenos produtores, caça, pesca e coleta de produtos florestais não-madeireiros. Para tomarem medidas de precaução ou adaptação, populações de pequena escala precisam perceber as mudanças climáticas. Embora a literatura sobre este tema seja vasta, os artigos científicos adotam conceitos alternativos de percepção das mudanças climáticas, o que pode dificultar a comparação dos resultados entre estudos. Assim, a equipe de revisão mapeou sistematicamente o uso do conceito de percepção na literatura de mudanças climáticas para entender como o conceito de percepção varia e é utilizado nessa literatura.

Métodos: Este mapa sistemático seguiu as diretrizes do *Collaboration for Environmental Evidence* (CEE). Cinco bases de dados eletrônicas de publicações científicas foram utilizadas, com termos de pesquisa pré-testados em inglês. Títulos, resumos e textos completos foram revisados usando critérios de elegibilidade pré-definidos, incluindo tratarem de populações de pequena escala ou indígenas habitantes de localidades rurais, e apresentarem explícita ou implicitamente o conceito de percepção das mudanças climáticas. Os artigos que atenderam os critérios de elegibilidade foram selecionados para leitura na íntegra, extração e codificação dos dados seguindo o *codebook* preparado previamente. Nenhuma avaliação crítica da validade dos estudos foi realizada para a seleção. Por fim, um banco de dados com metadados codificados de todos os estudos do mapa foi disponibilizado.

Resultados da revisão: Após a triagem de 5.358 artigos, foram identificados 361 artigos. Destes, 20% continham a definição explícita do conceito de percepção, que variaram entre si em sete grupos principais: percepção de risco, percepção segundo constructos psicológicos e estímulos sensoriais, consciência, experiência prévia, observação de variáveis climáticas, crenças e interpretação do ambiente e incertezas e ameaças. Definições implícitas de percepção com constructos diversos foram encontradas, como a percepção estabelecida pela Psicologia Cognitiva,

[4] Este capítulo gerou uma publicação em *Environmental Evidence Journal* que corresponder ao protocolo de mapeamento sistemático (Apêndice A).

consciência, percepção de risco, conhecimento tradicional, crenças e preocupações que os indivíduos têm sobre as mudanças climáticas, assim como ter sido exposto direta ou indiretamente aos seus efeitos, *attitude*, visão de mundo e conhecimento científico. Foi comum que os artigos abordassem sobre mais de um assunto. Em 88% dos artigos não apontaram uma teoria ao longo do texto. Ao menos na literatura mais recente, os continentes mais abordados foram o continente africano e asiático, e as populações de pequena escala não indígenas foram mais estudadas do que as populações de pequena escala indígenas.

Conclusões: Conclui-se que os conceitos são interdisciplinares, portanto, é inerente a continuidade de diálogo entre as diferentes disciplinas, buscando a interdisciplinaridade na definição do conceito de percepção. O aprofundamento sobre o conceito de percepção é necessário, pois a sua ausência pode levar a conclusões errôneas, estratégias de adaptação limitadas e a não percepção do que são as mudanças climáticas de fato pela população de pequena escala. Ademais, visões equivocadas do conceito podem levar a políticas com resultados pouco eficazes, colocando em risco as populações que já são as mais vulneráveis. Quanto aos resultados da pesquisa, sugere-se a realização de mais estudos com populações de pequena escala na região da América Central e América Latina. Definir o conceito e os seus constructos, torna possível a comparação entre os artigos. Quando isso não acontece, a comparação torna-se inviável, uma vez que os resultados serão diferentes, pois estão avaliando coisas distintas. Por fim, sem definições adequadas de percepção, é muito difícil para as populações de pequena escala, pesquisadores e outras partes interessadas apliquem uma estratégia de adaptação a longo prazo, pois a percepção é o primeiro passo para adoção de estratégias de adaptação e precisa de uma tradução em políticas ou em ferramentas adequadas para lidar com as mudanças que seja eficiente.

Palavras-chave: Aquecimento global. Consciência. Percepção. Percepção de risco. Povos indígenas. População de pequena escala. Variabilidade climática.

1. INTRODUÇÃO

Mudanças climáticas (MC) de origem antrópica já afetam todas as regiões do mundo, pois atividades humanas causaram o aquecimento de solos, oceanos e atmosfera nos últimos dois mil anos. Juntamente com o aumento da temperatura, desde a década de 1950, cresceu a probabilidade de eventos extremos, como ondas de calor, secas intensas, chuvas torrenciais, inundações e ciclones tropicais (IPCC, 2018). Para o futuro, o Painel Intergovernamental sobre Mudanças Climáticas (IPCC) prevê que o aquecimento global deverá inevitavelmente ultrapassar de 1,5°C-2°C durante o século XXI, a menos que as emissões de dióxido de carbono e outros gases de efeito estufa (GEE) sejam significativamente reduzidas nas próximas décadas (IPCC, 2018, 2021). Tais MC colocam em risco a saúde humana, as atividades econômicas, a segurança alimentar, o abastecimento de água e, consequentemente, os meios de subsistência humanos, principalmente de populações vulneráveis que vivem nos países em desenvolvimento (IPCC, 2018). Estima-se que, até 2030, as MC devem levar 132 milhões de pessoas para condições de pobreza (WORLD BANK, 2020).

Prevê-se que o aquecimento global ameace sobretudo populações rurais, especialmente os povos indígenas e outras sociedades de pequena escala que dependem diretamente dos recursos naturais para a própria subsistência (KRONIK; VERNER, 2010). Em realidade, as MC já impactam negativamente os meios de subsistência de populações de pequena escala (IWGIA, 2022). Para ilustrar, entre os agricultores de pequena escala, temperaturas mais altas e níveis mais baixos de precipitações aumentaram a incidência de pragas agrícolas na Bolívia (BOILLAT; BERKES, 2013) e mudaram o cronograma de plantio em Bangladesh (AHMED; ATIQUL HAQ, 2019). Na Amazônia peruana, as inundações mais intensas reduziram as populações de animais selvagens e, consequentemente, a oferta de carne selvagem consumida pelos indígenas (BODMER *et al.*, 2018). Entre caçadores indígenas, o recuo do gelo no Alasca prejudicou práticas culturais associadas à subsistência, ameaçando a segurança alimentar (SAKAKIBARA, 2009). Já para os indígenas do Ártico canadense, a imprevisibilidade climática, combinada ao gelo instável e mais fino, reduziu o consumo de carne e peixe selvagens, diminuindo a ingestão de nutrientes (ROSOL; POWELL-HELLYER; CHAN, 2016). No oeste do Himalaia, as mudanças na temperatura diminuíram a disponibilidade de produtos florestais não-madeireiros (PFNMs) entre os horticultores de pequena escala (NEGI et al., 2016) .

Embora esses exemplos demonstrem que o cenário atual é problemático, quando as populações de pequena escala percebem as MC existe a possibilidade de que elas mitiguem tais

impactos negativos. De fato, a conexão de longo prazo das populações de pequena escala e as interações contínuas com os ambientes naturais onde vivem, além de seu conhecimento tradicional, podem ajudá-las a perceber, entender e enfrentar as mudanças ambientais (FORD *et al.*, 2020). As populações indígenas têm grande capacidade de identificar as mudanças locais em seu território principalmente pelo conhecimento tradicional acumulado ser detalhado e desenvolvido a partir de uma interação direta e cotidiana das pessoas com o ambiente.

A percepção das mudanças é importante, pois aumenta a probabilidade de que populações de pequena escala tomem precauções ou adotem ações para lidar com seus impactos negativos ao longo do tempo, ou o que se convencionou chamar de estratégias de adaptação. Adaptação, nesse contexto, refere-se às respostas aos impactos esperados ou em andamento, que indivíduos, comunidades, empresas privadas ou governos implementam para conter, evitar danos, ou mesmo aproveitar potenciais benefícios (IPCC, 2022). A adaptação também envolve a capacidade de sobrevivência de um indivíduo e/ou comunidade (ADAMS, 2002). A adoção de tais estratégias necessariamente se inicia com a percepção da população afetada sobre as mudanças esperadas ou em curso (ALAM; ALAM; MUSHTAQ, 2017; DERESSA; HASSAN; RINGLER, 2011). Somente quando a população reconhece as mudanças e tem informações sobre seus prováveis impactos, elas podem avaliar se é possível responder, adotando se e quando necessário alguma estratégia de adaptação considerada adequada (MADDISON, 2007).

Além da relevância da própria população perceber as MC e seus impactos, é importante entender como se dá esse processo, pois tal conhecimento pode (i) contribuir para identificar impactos ou mudanças negligenciadas pela literatura científica que, contudo, são relevantes para a população local, e (ii) complementar com informações sobre locais onde os dados meteorológicos são inexistentes, por não existirem estações meteorológicas ou quando são deficientes, como quando há falhas no registro de dados nas estações meteorológicas durante alguns dias ou meses (OYERINDE *et al.*, 2015). Em resumo, investigar se, quando e como as populações de pequena escala percebem as MC é essencial, e os cientistas têm respondido de acordo, com uma profusão de estudos sobre o tema.

Apesar disso, muitos estudos no tema não adotam uma definição explícita, ou pelo menos clara, do conceito de percepção (por exemplo, ANYANWU; NWAJIUBA, 2021; EKEMINI-RICHARD; AYANWALE; ADELEGAN, 2020; MIJIDDORJ et al., 2020; MURINGAI et al., 2019; OGRA et al., 2020; WALDMAN et al., 2019b). Embora o conceito possa ter significados

diferentes mesmo dentro de uma mesma área, um elemento comum à maioria das conceituações de percepção é que esta envolve a análise de informações sensoriais. Assim, quando os psicólogos cognitivos tratam das percepções, eles geralmente se referem aos processos cognitivos básicos envolvidos na análise de informações recebidas pelos sentidos das pessoas (BRAISBY, NICK; GELLATLY, 2012). Em contraste, nos estudos sobre MC que fornecem uma definição de percepção (e.g., GHAZALI et al., 2021; HASAN; KUMAR, 2020; MAIRURA et al., 2021; SÁNCHEZ-CORTÉS; CHAVERO, 2011; SRAKU-LARTEY et al., 2020), as conceituações adotadas são diversas e abrangem não apenas percepções sensoriais (e.g., AHMED; ATIQUL HAQ, 2019; BALAMA et al., 2016; HASAN; KUMAR, 2020; HERMAN-MERCER et al., 2016), mas também: interpretações subjetivas das pessoas (e.g., HASAN; KUMAR, 2019), a consciência (*awareness)* e interpretação das experiências sobre o meio ambiente (e.g., SÁNCHEZ-CORTÉS; CHAVERO, 2011; SHUKLA et al., 2019); crenças sobre mudanças em curso (e.g., MAIRURA et al., 2021; SRAKU-LARTEY et al., 2020); bem como experiências prévias em relação à variabilidade climática (e.g., MAIRURA et al., 2021).

Devido a essa variedade de definições sobre a percepção das MC, comparações e sínteses da literatura científica são dificultadas por pelo menos três motivos. Em primeiro lugar, as várias áreas temáticas adotam diferentes conceitos de percepção das MC, o que dificulta a padronização de uma definição do conceito. Por exemplo, o conceito é incorporado em estudos sobre conhecimento tradicional/local (MIJIDDORJ *et al.*, 2020; WYLLIE DE ECHEVERRIA; THORNTON, 2019) ou sua comparação com dados meteorológicos reais (AYANLADE; RADENY; MORTON, 2017; HASAN; KUMAR, 2019), estratégias de adaptação (ALAM; ALAM; MUSHTAQ, 2017), vieses cognitivos (WALDMAN *et al.*, 2019b) e determinantes que explicam as percepções (PAUDEL *et al.*, 2020). Em segundo lugar, os estudos divergem sobre as unidades amostrais adotadas para investigar percepções, variando sobretudo entre indivíduos, unidades domésticas e comunidades. Em terceiro, os estudos contam com diferentes métodos de investigação (qualitativos, quantitativos ou mistos) (FIERROS-GONZÁLEZ; LÓPEZ-FELDMAN, 2021), com implicações na forma como os resultados podem ser interpretados e o conceito de percepção definido.

Assim, como forma de entender como é adotado e contribuir à padronização no uso do conceito na literatura, este artigo sintetiza as informações sobre as definições alternativas de percepção das MC. Desta maneira, pretende-se facilitar e tornar mais confiáveis as sínteses e

comparações de informações da literatura empírica futura. Por sua vez, essas avaliações são importantes para o delineamento e adoção de políticas de adaptação, particularmente em contextos de populações de pequena escala. Portanto, este artigo busca também auxiliar a identificar lacunas de conhecimento onde são necessárias avaliações e sínteses futuras sobre a percepção das MC.

2. OBJETIVO DA REVISÃO

O objetivo do mapeamento sistemático foi identificar, classificar e descrever as evidências disponíveis sobre os vários conceitos adotados pela literatura científica para se referir às percepções das MC. Esta revisão concentrou-se na literatura científica dos últimos cinco anos (2018 a 2022) referente às populações rurais de pequena escala, incluindo as sociedades indígenas. Esse tipo de população foi escolhido, pois tais sociedades dependem diretamente dos recursos naturais, e por conta disso, são mais propensas a sofrerem os efeitos adversos das MC (KRONIK; VERNER, 2010). Além disso, a percepção das MC pode auxiliá-las na adaptação das próprias práticas de subsistência (REID *et al.*, 2014) e, com isso, sofrer menos potenciais efeitos negativos.

A pergunta principal deste mapeamento sistemático foi:

"Quais são as definições de percepção das MC adotadas na literatura em populações de pequena escala dos últimos cinco anos (2018 a 2022)?"

Os componentes da questão principal e suas definições foram os que seguem.

- <u>População</u> (*population*) (P): pequenas populações, compreendendo também os povos indígenas, vivendo em áreas rurais, consistindo em indivíduos que produzem seus próprios recursos para subsistência através do trabalho familiar, com pouca ou nenhuma capacidade de gerar excedentes de produção para o mercado (KHALIL et al., 2017).
- <u>Exposição</u> (*exposure*) (E): o artigo deveria abordar sobre MC.
- <u>Resultado</u> (*outcome*) (O): o artigo deveria abordar sobre o conceito de percepção das MC (implícita ou explicitamente).
- <u>Métodos</u> (*types of study design*): consideramos estudos empíricos baseados em dados primários, empregando métodos quantitativos e/ou qualitativos de coleta de dados.

As questões secundárias do mapeamento sistemático foram:

"Como as definições de percepção das MC variam e são interpretadas entre os artigos, segundo as áreas temáticas, populações de interesse e localização geográfica?"

"Quais constructos[5] diferenciam uma definição de outra? Existem similaridades?"

3. FRAMEWORK TEÓRICO SOBRE PERCEPÇÃO

O estudo das percepções humanas faz parte, em particular, da Psicologia Cognitiva (BENSON et al. 2012; STERNBERG; STERNBERG; MIO, 2012), área científica que surgiu na década de 1950, mas foi reconhecida como um campo de estudo com métodos próprios somente a partir dos anos 1970 (STERNBERG; STERNBERG; MIO, 2012). Além das percepções humanas, o campo investiga outros processos mentais como memória, linguagem, atenção, resolução de problemas, consciência, emoção, raciocínio (BRAISBY; GELLATLY, 2012), aprendizagem e motivações (STERNBERG; STERNBERG; MIO, 2012).

No campo da Psicologia Cognitiva, a percepção é definida como o conjunto de processos complexos por meio dos quais um indivíduo processa as informações recebidas dos estímulos do ambiente, atribuindo significado a elas (STERNBERG; STERNBERG; MIO, 2012). A percepção envolve a análise sensorial (PIKE; EDGAR; EDGAR, 2012), pois é a partir de sensações percebidas através dos receptores sensoriais (ouvidos, nariz, língua, pele e olhos) que o indivíduo reconhece, interpreta e organiza alguma informação (POMERANTZ, 2003).

Para isso, há teorias da Psicologia Cognitiva que descrevem como a percepção humana operaria e dois grupos se apresentam como contraditórias para explicar a percepção: teorias *top-down* e *bottom-up* (STERNBERG; STERNBERG; MIO, 2012).

As teorias *bottom-up*, denominadas como de percepção direta, baseiam-se no considerar que os estímulos e a informação sensorial são os pontos de partida para a percepção (PIKE; EDGAR; EDGAR, 2012). O indivíduo observa algo e a informação obtida através dos receptores sensoriais é transportada ao cérebro (STERNBERG; STERNBERG; MIO, 2012). Portanto, o indivíduo utilizaria os sentidos (visão, audição, olfato, tato) ao entrar em contato com eventos climáticos extremos e com os impactos das MC.

As teorias *top-down*, denominadas como percepção construtiva, indicam que primeiro é utilizado o conhecimento preexistente armazenado na memória, as expectativas já existentes sobre o que está sendo visto, os processos cognitivos e, em certos casos, as experiências anteriores para orientar o processamento das informações sensoriais pelo indivíduo (STERNBERG;

[5] Constructos são conceitos teóricos mentais baseados em fenômenos observáveis, definidos como: "uma ideia ou conceito complexo formado a partir de uma síntese de ideias mais simples"(APA, 2007, p.239).

STERNBERG; MIO, 2012). Nesta abordagem, o que é visto como estímulo sensorial depende do que o indivíduo sabe previamente (BRAISBY; GELLATLY, 2012). Logo, o indivíduo utilizaria primeiro o que ele conhece para construir o que ele percebe que seriam as MC e seus efeitos e depois, quando de fato as visualizasse, saberia o que é. Esse conhecimento prévio poderia vir através do conhecimento adquirido por meio: (i) da exposição direta (ter vivenciado e tido contato direto com os efeitos das mudanças); (ii) da exposição indireta (relatos de outras pessoas ou acesso à mídia); (iii) do conhecimento tradicional transmitido através das gerações e (iv) do conhecimento científico.

Embora essas diferentes teorias sejam tratadas como opostas na literatura, elas podem ser complementares, pois é provável que os indivíduos utilizem ambas as formas explicitadas nas duas teorias para perceberem algo (STERNBERG; STERNBERG; MIO, 2012) e elas descrevem aspectos diferentes da percepção (BRAISBY; GELLATLY, 2012).

Na percepção sobre as MC, ambas as teorias são válidas, uma vez que tanto a percepção direta do estímulo sensorial, quanto o conhecimento e a experiência prévia contribuem para a percepção das MC pelo indivíduo.

Para que a percepção ocorra, são necessários dois estímulos que ocorrem naturalmente: estímulo distal e proximal. No estímulo distal, o objeto ou evento físico deve estar separado do indivíduo por alguma distância física (POMERANTZ, 2003; STERNBERG; STERNBERG; MIO, 2012). A imagem do objeto ou evento chega até os receptores sensoriais (estímulo proximal), sendo afetada pelas condições de iluminação, cor, ângulo de visão, mudanças de forma (POMERANTZ, 2003), informação tátil, ondas sonoras, estimulação olfativa ou gustativa, moléculas químicas, variando a depender de cada receptor (STERNBERG; STERNBERG; MIO, 2012). Desse modo, a percepção ocorre quando há elaboração do que está sendo percebido sensorialmente pelo indivíduo, refletindo o que está no mundo externo (STERNBERG; STERNBERG; MIO, 2012).

No caso das MC, a percepção pode resultar da junção de diversas sensações e estímulos. Dentre elas, do objeto, ser ou fenômeno que um indivíduo vê a determinada distância física; por exemplo, quando observa eventos climáticos extremos, como inundações, precipitações ou seca extrema, incêndios florestais, dentre outros acontecimentos. Além da visão, pode contribuir a sensação tátil estimulada pelo evento. Por exemplo, em ondas de calor extremo, a sensação térmica é mais intensa, enquanto as quedas bruscas de temperatura tendem a tornar o frio mais evidente e, durante inundações, pode-se sentir o toque da água na pele. O som emitido pelo evento também é

um estímulo importante, como o som da água da chuva, o ruído causado pelo aumento do nível do rio, pelo vento derrubando árvores ou do fogo queimando uma floresta. O olfato também colabora nas percepções; por exemplo, o cheiro percebido de árvores queimadas ou de certos gases poluentes que foram emitidos.

Embora a percepção auxilie as pessoas a se atentarem aos efeitos das MC, a sobreviverem e vivenciarem o mundo, ela pode ser limitada por ao menos quatro fatores principais.

Primeiro, muitas das MC são lentas, ao menos do ponto de vista não geológico, posto que demoram muitos anos para ocorrer e serem percebidas pelas pessoas (e.g., desaceleração da circulação oceânica, derretimento das geleiras, degelo do *permafrost*) (BROVKIN *et al.*, 2021). Portanto, os seres humanos podem não se atentar ao que está sendo observado e, com isso, subestimam as alterações por não conseguirem "enxergar" as MC como um processo (CHEN, 2011). Contribui para isso o fato de que humanos percebem apenas uma faixa do espectro eletromagnético (luz visível), ouvem somente entre 20-20.000 hertz e não percebem eventos que acontecem muito rápido ou muito devagar (POMERANTZ, 2003).

Como segundo fator, a percepção pode ser imprecisa, pois fenômenos físicos podem criar uma ilusão de óptica (POMERANTZ, 2003); ou seja, o que sentimos pelos órgãos sensoriais nem sempre reflete o que está ocorrendo de fato ou a realidade (STERNBERG; STERNBERG; MIO, 2012).

Terceiro, a percepção humana é seletiva, uma vez que a atenção é mantida ou focaliza um determinado aspecto enquanto ignora o que está ao redor. Por conseguinte, a atenção é desviada quando outro acontecimento chama mais a atenção (POMERANTZ, 2003). Esta variação do estímulo é uma característica da percepção, portanto, o que as pessoas experienciam pelos sentidos depende do que a atenção seleciona e constrói na mente (STERNBERG; STERNBERG; MIO, 2012).

Por fim, o contexto (POMERANTZ, 2003; REISBERG, 2010), as crenças, concepções e práticas culturais da sociedade, assim como as experiências prévias e o conhecimento acumulado pelo indivíduo podem influenciar a percepção que este tem das MC (CHEN, 2011).

4. MÉTODOS

O mapeamento sistemático seguiu as diretrizes do guia *Collaboration for Environmental Evidence (CEE)* (CEE, [s.d.]) e esteve em conformidade com o protocolo *Reporting standards for*

Systematic Evidence (ROSES) (HADDAWAY *et al.*, 2018) (ver Apêndice B). O mapeamento foi conduzido de acordo com o protocolo publicado em TRONCARELLI; MORSELLO, 2022.

O mapeamento sistemático é uma técnica de revisão transparente, rigorosa e objetiva (i.e. segue um protocolo bem definido), que permite reduzir vieses inerentes às revisões narrativas tradicionais (HADDAWAY *et al.*, 2018; JAMES; RANDALL; HADDAWAY, 2016). A técnica descreve a literatura existente sobre um tópico específico, por meio de agrupamento de informações e da descrição das evidências disponíveis catalogadas em um banco de dados. A base de dados final constitui nos metadados de estudos que descrevem a quantidade e a natureza das pesquisas sobre um determinado assunto (BATES; CLAPTON; COREN, 2007; JAMES; RANDALL; HADDAWAY, 2016). Em nosso caso, os metadados descreveram: informações bibliográficas; área de estudo, origem e estratégias de subsistência das populações investigadas; áreas temáticas abordadas nos artigos; diferentes definições de percepção das MC; construtos que fazem parte dessas definições; fenômenos observados nesses artigos (físicos, biológicos e humanos); informações sobre a unidade amostral, tipo de dados e métodos de coleta (para mais informações, ver Apêndice C - Codebook).

O mapeamento sistemático é uma abordagem sistemática mais apropriada para questões de revisão cuja resposta tenha uma estrutura aberta (i.e., sejam descritivas), como a nossa. É também uma alternativa às revisões sistemáticas quando os estudos a serem codificados são altamente heterogêneos e foram gerados por diferentes metodologias, como quando há um misto de pesquisas qualitativas e quantitativas (JAMES; RANDALL; HADDAWAY, 2016). As evidências coletadas a partir desta abordagem podem ser usadas para desenvolver conceituações sobre um tópico específico, em nosso caso, a percepção das MC.

4.1. Desvios do protocolo original

Houve desvio do protocolo original publicado (TRONCARELLI; MORSELLO, 2022) quanto ao período de abrangência do mapeamento, pois na publicação não se apresentava quais anos seriam incluídos no mapeamento. Portanto, o período de abrangência da pesquisa escolhido foram os últimos cinco anos, especificamente de 2018 a 2022. Reconhece-se que o desvio pode ter trazido limitações quanto aos resultados, conforme discutido ao final deste capítulo.

4.2. Busca por artigos

A busca por artigos ocorreu em cinco bases de dados científicos eletrônicos de publicações científicas: “Scopus”, “Web of Science Core Collection” (WoS), “BASE – Bielefeld Academic Search Engine”, “Science Direct Elsevier” e “PubMed” entre 18/03/2022 a 02/01/2023, buscando artigos entre 2018 a 2022. Esses bancos de dados são abrangentes, multidisciplinares e baseados em periódicos revisados por pares. Em conjunto, abrangem a maioria das publicações no domínio das Ciências Ambientais que dizem respeito às percepções das MC.

As cinco bases de dados selecionadas são também robustas, pois implementaram processos para garantir a qualidade dos periódicos revisados. Na WoS, há um processo de curadoria por editores especializados, assim como especialistas internos, cada um dos quais é responsável por uma categoria de assunto específica. Esses editores não têm afiliação com nenhuma editora ou instituto de pesquisa para evitar vieses. Para serem incluídos na base de dados WoS, os periódicos são avaliados com um conjunto de 28 critérios (24 critérios de qualidade e quatro critérios de impacto) (CLARIVATE, [s.d.]). Da mesma forma, a Scopus conta com um grupo independente e internacional de cientistas e pesquisadores com experiência em edição de periódicos para avaliar a qualidade dos periódicos. Os pesquisadores são especialistas em seus respectivos campos e, juntos, formam o *Scopus Content Selection and Advisory Board* (CSAB) responsável pela seleção dos periódicos incluídos (“Elsevier”, [s.d.]). A terceira fonte, BASE, fornece mais de 240 milhões de documentos de mais de 8.000 fontes, com 60% dos documentos indexados na categoria de acesso aberto. O BASE indexa documentos e periódicos que atendem a requisitos específicos de qualidade e relevância acadêmica, avaliados por pessoal qualificado da Biblioteca da Universidade de Bielefeld, na Alemanha (“BASE”, [s.d.]). A quarta fonte, o banco de dados Science Direct Elsevier, contém mais de 2.200 periódicos em tópicos que abordam a emergência climática global (“Science Direct Elsevier”, [s.d.]). Por fim, PubMed é um recurso gratuito do *U.S. National Institutes of Health* (NIH) de periódicos nas áreas de Biomedicina e Saúde e contém mais de 34 milhões de citações e resumos de literatura biomédica (“PubMed”, [s.d.]).

Embora a escolha de cinco bases de dados englobe uma ampla gama da literatura em Ciências Ambientais, certamente deixou de fora diversas publicações. Mesmo assim, como esta revisão visou compreender qualitativamente a conceituação dos termos referentes às percepções das MC, a estratégia de busca foi considerada adequada. Isso porque não há razões para crer que

as publicações negligenciadas apresentam diferenças em termos da conceituação dos termos e, além disso, os principais periódicos da área foram incluídos.

Os procedimentos de busca deixaram de fora os periódicos regionais em outros idiomas, como o português, por exemplo. Todavia, a inclusão de bancos de dados focados apenas em fontes bibliográficas específicas dessa região ou de poucas, provavelmente enviesaria as conclusões para os idiomas que poderiam ser revisados, possivelmente dando uma impressão errônea das diferenças regionais. É importante também ressaltar que todos os procedimentos de codificação deveriam ser traduzidos e as buscas repetidas em vários idiomas, o que tornaria o processo inviável, dado o enorme número de publicações sobre o tema.

4.2.1. Busca de termos

A *string* de pesquisa desta revisão, i.e. a combinação de termos-chave usando operadores booleanos (*AND, OR*), incluiu palavras em inglês abrangendo três grupos de conceitos: (i) percepção ou consciência (*awareness)*; (ii) mudanças climáticas ou aquecimento global e (iii) população de pequena escala (*smallholders*), incluindo povos indígenas. Foi usado caractere especial (asterisco) na pesquisa para incluir formas alternativas de terminações de palavras e formas no plural, exceto nas bases de dados que não aceitavam o asterisco (BASE, Science Direct e PubMed). Para obter detalhes sobre o processo de elaboração de *strings*, consulte o Apêndice D.

Nas cinco bases de dados, buscaram-se estudos com os termos selecionados aparecendo no título, resumo ou palavras-chave do artigo. Sinônimos comuns foram incluídos na seleção de termos de pesquisa (Tabela I.1), com exceção de *awareness*.

Tabela I.1 - Termos centrais e sinônimos ou formas alternativas incluídas na *string*

Termo central	Sinônimos e formas alternativas	Sinônimos sem efeito[6]
Perception	*perception*; local perspective**	*"climate change perception"*
Awareness	*n.i.*	*n.i.*
Climate change	*climat* chang*; global warming; chang* climat*; climat* variability*[7]; climat* event**	*n.i.*
Small-scale population	*indigenous; smallholder*; small scale*; livelihood*; fisher*; "peasant*"; "hunter*"; "agricultur*"; "forager*"; "agropastoralist*"; "horticultur*"; "pastoralist*"; "herder*"; "small-island*"*	*"indigenous group"; "hunter-gather"*

Nota: n.i.=não incluído. O uso de hífen ou não em "*small scale*" e "*small-island*" não teve efeitos na busca. O uso de asterisco incluiu as formas alternativas de terminações de palavras e plurais. As palavras foram mantidas em inglês.

As diferentes *strings* de pesquisa utilizadas em cada uma das bases de dados, incluindo as adaptações necessárias, foram, respectivamente:

1. *Scopus:* (TITLE-ABS-KEY ((("perception*" OR "local perspective*" OR "awareness") AND ("climat* chang*" OR "global warming" OR "chang* climat*" OR "climat* variabilit*" OR "climat* event*") AND ("indigenous*" OR "smallholder*" OR "small scale*" OR "livelihood*" OR "fisher*" OR "peasant*" OR "hunter*" OR "agricultur*" OR "forager*" OR "agropastoralist*" OR "horticultur*" OR "pastoralist*" OR "herder*" OR "small-island*"))))
2. *WoS:* ALL FIELDS (("perception*" OR "local perspective*" OR "awareness") AND ("climat* chang*" OR "global warming" OR "chang* climat*" OR "climat* variabilit*" OR "climat* event*") AND ("indigenous*" OR "smallholder*" OR "small scale*" OR "livelihood*" OR "fisher*" OR "peasant*" OR "hunter*" OR "agricultur*" OR "forager*" OR "agropastoralist*" OR "horticultur*" OR "pastoralist*" OR "herder*" OR "small-island*"))

[6] Sinônimos sem efeito englobam termos que não retornaram mudanças na busca ao serem inseridos, i.e. após sua inserção os resultados apresentados foram os mesmos em quantidade (número de artigos).

[7] Embora conste como forma alternativa, *climate change* e *climate variability* não são sinônimos. A variabilidade climática representa as flutuações das variáveis que caracterizam o clima (temperatura, precipitação, ventos, etc.) em torno de uma condição média. Já o clima e as mudanças climáticas se referem às mudanças dessas condições médias.

3. *BASE:* Entire document: ("perception" OR "awareness") AND ("climate change" OR "global warming") AND ("indigenous" OR "smallholder" OR “small-island”)
4. *Science Direct:* Title, abstract, keywords: (("perception" OR "awareness") AND ("climate change" OR "global warming") AND ("indigenous" OR "smallholder" OR “small-island”))
5. *PubMed:* (("perception" OR "awareness") AND ("climate change" OR "global warming") AND ("indigenous" OR "smallholder" OR “small-island”))

4.2.2. Estimativa da abrangência da pesquisa

A abrangência da *string* de pesquisa foi testada comparando o resultado da pesquisa com uma lista-teste de 95 publicações de referência sobre a percepção das MC em populações de pequena escala. Essa lista se originou da experiência da equipe de revisão com a literatura sobre o assunto através de uma revisão não sistemática. Com essa lista, foi avaliada a porcentagem de artigos nas bases de dados Scopus, Web of Science Core Collection e BASE – Bielefeld Academic Search Engine. Foram substituídos alguns termos na *string*, como: (i) remoção do termo “*perceive**”; (ii) substituição de “*hunt**” por “*hunter**”; (iii) substituição de *AND* por *OR*; (iv) adição do termo "*small-island**", resultando nas *strings* finais no item 4.2.1. A *string* de busca final resultou em 94 artigos (99%) nas três bases de dados, portanto, a abrangência da estratégia de busca foi considerada suficiente pela equipe de revisão. A lista teste com as 95 publicações de referência pode ser visualizada no Apêndice E.

4.3. Triagem dos artigos e critérios de elegibilidade do estudo

As cinco bases de dados (Scopus, WoS Core Collection, BASE – Bielefeld Academic Search Engine, Science Direct Elsevier e PubMed) foram acessadas por meio da assinatura institucional *Virtual Private Network* (VPN) da Universidade de São Paulo, Brasil. Foram aplicados os filtros aos campos de busca no Scopus e WoS: (i) artigo no tipo de documento e (ii) inglês no idioma. No BASE, foi selecionada a pesquisa básica (*basic search*), filtrando por inglês (*English*) no idioma (*language*) e contribuição do artigo (*article contribution*) no tipo de documento (*document type*). No Science Direct, foi escolhida a pesquisa avançada (*advanced search*), filtrada por título, resumo ou palavras-chave especificadas pelo autor (*title, abstract or author-specified keywords*) e inserida a *string* de pesquisa. No PubMed nenhum filtro foi aplicado.

A seleção foi restrita a artigos que reportaram o uso de dados primários. Livros e capítulos de livros foram excluídos, pela não garantia do acesso a eles. Portanto, os seguintes tipos de documentos foram excluídos: (i) documentos em idiomas diferentes do inglês; (ii) artigos de revisão, livros, capítulos de livros, anais de eventos, artigos e resumos de congressos, editoriais, cartas e *data papers*.

Antes da fase de triagem, os artigos duplicados das cinco bases de dados foram identificados e removidos usando uma planilha Excel. Foi encontrado apenas um artigo cuja autoria foi de um dos membros da equipe de revisão, que correspondeu ao protocolo publicado (Apêndice A). Além deste, não foram encontrados outros artigos cuja autoria tenha sido de um dos membros da equipe de revisão. Logo, nenhum membro da equipe foi impedido de participar da decisão de codificação sobre os artigos. Esta revisão não buscou esforços adicionais para obtenção da literatura, como a consulta a especialistas ou partes interessadas, dado que a literatura é ampla e o procedimento era desnecessário ao propósito desta revisão.

4.3.1. Processo de triagem

Duas etapas sucessivas de triagem foram seguidas para avaliar a elegibilidade dos artigos: (1) título e resumo e (2) texto completo. O título, resumo e texto completo foram avaliados independentemente por dois revisores, e os resultados da avaliação foram comparados. Um exercício de calibração foi empregado para verificação de consistência.

Os artigos que atenderam aos critérios de elegibilidade no título e resumo passaram para a segunda etapa, enquanto os que não o fizeram foram excluídos na primeira etapa. Artigos com apenas título e sem resumo foram lidos na íntegra. Já a segunda etapa consistiu na leitura completa dos artigos que cumpriram os critérios da primeira etapa da triagem. Em ambas as etapas, discrepâncias quanto à avaliação pelas revisoras foram discutidas em reuniões semanais. Nos casos em que as divergências não foram resolvidas, a decisão de incluir ou não cada artigo dependeu do voto de desempate de uma terceira revisora. Artigos duplicados foram removidos.

Para garantir a consistência e precisão das decisões de inclusão/exclusão ao longo do processo de triagem, foi verificada a consistência do processo por meio da seleção aleatória de 5% dos artigos para triagem do (i) título e resumo (n=175) e (ii) texto completo (n=21). Com essa amostra, foi calculada a taxa de concordância entre os revisores quanto à lista de artigos que atenderam aos critérios de inclusão nas etapas 1 e 2. Os resultados da verificação de consistência

foram comparados entre os revisores, e todas as discordâncias foram discutidas em detalhe até que o nível de consistência fosse de pelo menos 80%. O nível de consistência na etapa 1 e 2 foi de 90%.

4.3.2. Critérios de eligibilidade

Os critérios a seguir foram atendidos para inclusão de cada um dos artigos desta revisão:

População: foram incluídos artigos que tratavam apenas de populações de pequena escala (incluindo povos indígenas) que habitavam áreas rurais. Portanto, foram excluídos artigos que: (i) tratavam de propriedades rurais extensivas, como aquelas dedicadas à monocultura comercial voltada para mercados de *commodities* (como agronegócio), assim como (ii) populações de pequena escala que residiam em áreas urbanas e (iii) aqueles casos em que não havia especificação da população-alvo. Populações de pequena escala incluíram os agricultores familiares ou horticultores de subsistência, pescadores usando barcos de madeira de pequeno e médio porte, pastoralistas (*pastoralists, herders*) ou agropastoralistas (*agropastoralists*) e caçadores-coletores (*hunter-gatherers*) ou forrageadores (*forragers*).

Resultados (*outcomes*): o artigo deveria abordar o conceito de percepção das MC, independentemente de sua definição ter sido apresentada de forma explícita ou implícita.

Tipos de delineamento dos estudos (*types of design study*): foram considerados todos os estudos empíricos baseados em dados primários, empregando métodos tanto quantitativos como qualitativos de coleta de dados.

4.4. Avaliação crítica de validade dos estudos

A avaliação crítica da validade e qualidade dos estudos é opcional em mapeamentos sistemáticos, devendo ser adotada para avaliar a validade da base de evidências quando houver um nível suficiente de detalhes metodológicos (JAMES; RANDALL; HADDAWAY, 2016). Analisar aspectos como a causalidade de algum processo ou sua generalização para contextos determinados foi considerado irrelevante neste mapeamento dada sua natureza descritiva. O interesse e propósito do artigo era descrever a variabilidade no uso do conceito de percepção na literatura publicada, como forma de obter uma visão geral das semelhanças e diferenças conceituais na literatura sobre as dimensões humanas das MC. Sendo assim, não houve restrição na escolha de artigos elegíveis quanto à qualidade ou em aspectos relativos à validade interna ou externa.

4.5. Estratégia de codificação dos dados

Para verificar o grau de consistência do intercodificador (ver: CEE, [s.d.]), uma amostra de 5% do número total de artigos (n=21) foi codificada independentemente por dois membros da equipe de revisão. A seleção desses artigos nas bases de dados seguiu a ordem de classificação por data na lista de saída, ou seja, foram lidos primeiramente os artigos com as datas mais recentes que apareciam, portanto, no topo da lista. Depois da codificação dessa amostra de artigos, foram discutidas inconsistências e dúvidas. Nos casos em que houveram divergências e quando necessário, as decisões foram tomadas com a ajuda de um terceiro membro da equipe.

Na codificação, todos os artigos foram submetidos a uma dupla triagem para garantir a consistência. Reuniões semanais da equipe foram realizadas para discutir problemas e alinhar atividades entre revisores para garantir a consistência na codificação.

A triagem de texto completo ocorreu após os critérios de inclusão serem atendidos. A seguir, a extração e codificação dos dados foi realizada seguindo uma lista de códigos (*codebook*) preparada antes do início do mapeamento (Apêndice C). Essa lista seguiu a seguinte estrutura geral, enquanto detalhes podem ser vistos no Apêndice C:

- Informações bibliográficas: título, autor(es), revista, ano, DOI.
- Local do estudo: país.
- Origem da população investigada: todos indígenas, todos não indígenas, indígenas e não indígenas, não especificado.
- Estratégia de subsistência da população investigada: pequeno agricultor, pequeno produtor agropastoril, forrageiro ou caçador-coletor ou pescador-coletor, horticultor, pastor, outro.
- Áreas temáticas abordadas no artigo: adaptação, consciência, conhecimento tradicional (com e sem indicadores), conhecimento científico, comparação entre observações das percepções individuais com dados científicos, mudanças observadas nas atividades de subsistência, mudanças observadas no ambiente, fatores determinantes da percepção, mitigação, resiliência, percepção de risco, outra área temática não listada.
- Existência ou inexistência de definição de percepção explícita: explícita, implícita, outra.
- Parte do texto onde aparece a definição de percepção: introdução, métodos, resultados, discussão, conclusão, outros.
- Descrição da definição explícita de percepção das MC: conforme descrito pelos autores.

- Descrição de quais construtos fazem parte das definições de percepção de MC adotadas no artigo, significando que a percepção é mensurada, por exemplo, como: a observação de mudanças no ambiente; a experiência sensorial; a crença das pessoas de que uma MC está ocorrendo, as atitudes frente às mudanças (avaliação positiva ou negativa), conhecimentos tradicionais, entre outros.
- Descrição de como a percepção é apresentada nos resultados, discussão ou conclusão do artigo: independentemente de haver ou não uma definição de percepção. Por exemplo, a percepção é descrita como: (i) observação de mudanças, (ii) conhecimento tradicional ou científico, (iii) grau de preocupação do indivíduo com os efeitos das MC nas atividades de subsistência, entre outros.
- Descrição de como a percepção aparece nos resultados: conforme descrito pelos autores (quando explícito).
- Descrição do fenômeno observado no artigo: fenômeno físico, fenômeno biológico, fenômeno humano, outro tipo de fenômeno.
- Descrição da unidade de amostragem dos dados coletados no nível: individual, unidade doméstica (*household*), nível individual e da unidade doméstica, nível comunitário ou aldeia, organizações (e.g., Organizações não-governamentais (ONGs), associações), outros.
- Descrição dos dados utilizados no artigo para análise dos métodos: dados primários, dados secundários, dados primários e secundários, outros.
- Descrição dos métodos utilizados no artigo: métodos qualitativos, métodos quantitativos, métodos mistos, outros.

4.6. Método de mapeamento dos dados

O número de artigos encontrados em cada etapa da revisão foi compilado e apresentado em um fluxograma de mapa sistemático. As informações foram extraídas em um banco de dados apresentado em formato de planilha Excel. Todas as definições explícitas de percepção de MC identificadas foram incluídas neste documento e em um arquivo adicional.

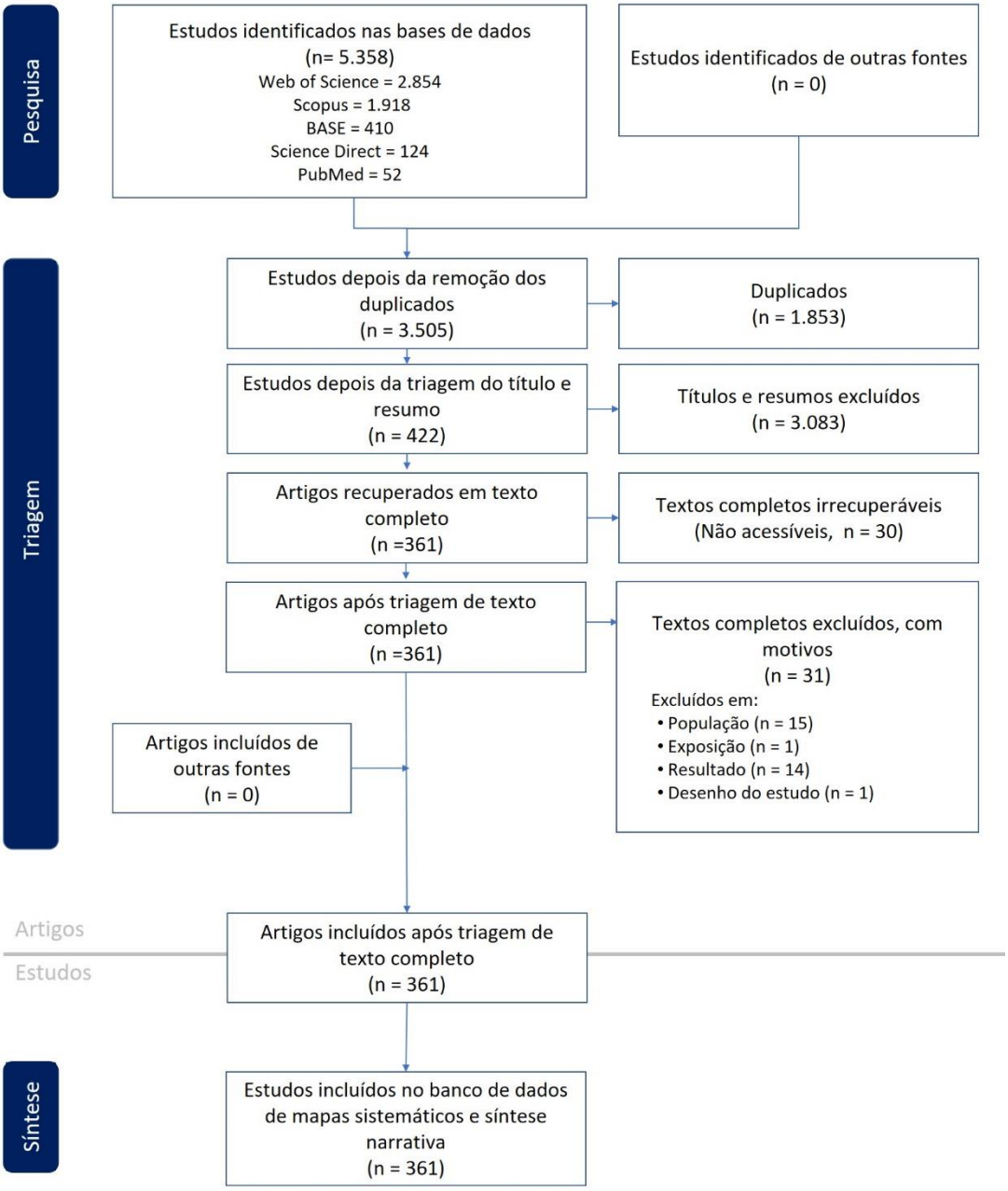
Uma síntese com a descrição dos diversos constructos e das teorias tratadas na literatura revisada foram apresentados em uma tabela. Informações descritivas sobre as evidências que abrangem o ano, distribuição geográfica, origem da população, atividades de subsistência

praticadas pela população estudada e a metodologia adotada, foram reunidas e apresentadas em uma série de gráficos.

5. RESULTADOS

No total, foram identificados 5.358 artigos científicos nas cinco bases de dados investigadas. Foram removidos 1.853 artigos duplicados em mais de uma base, resultando em 3.505 artigos entre 2018 e 2022. Nestes artigos, foi realizada a triagem de título e resumo, a partir da qual foram selecionados 422 artigos para possível leitura na íntegra. Dos 422 artigos, 30 não estavam acessíveis (artigos pagos) e 31 não atendiam aos critérios de elegibilidade. Portanto, na etapa de leitura de textos completos, foram incluídos 361 artigos para extração de dados. A Figura I.1 fornece um resumo quantitativo do processo de busca e triagem utilizados para identificar os artigos incluídos. Já a lista completa de referências dos artigos selecionados para leitura na íntegra, incluindo aqueles que não foram recuperáveis e aqueles não selecionados para leitura na íntegra, é fornecida no Apêndice F. A lista completa dos artigos excluídos na etapa de filtragem por título e resumo, juntamente com os motivos da exclusão é fornecida no Apêndice G.

Figura I.1 - Diagrama de fluxo ROSES ilustrando o processo de pesquisa e triagem da literatura

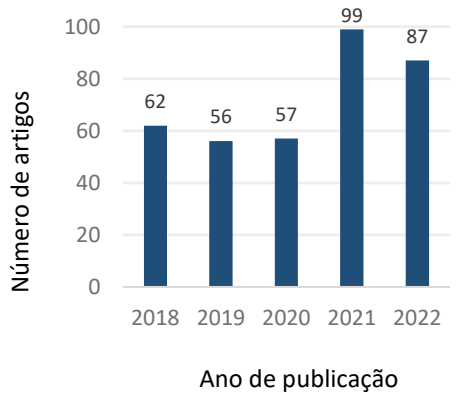


Fonte: HADDAWAY, 2017.

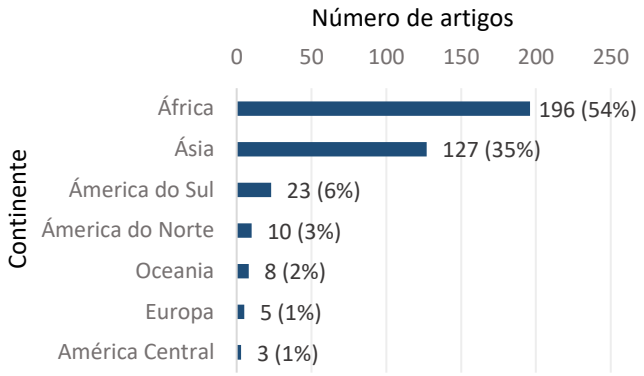
5.1. Ano de publicação e localização geográfica das áreas de estudo

No período de 2018 a 2022 analisado, os anos em que houve mais artigos publicados foi 2021, com 27% do total das publicações (n=99) e 2022 com 24% (n=87). A seguir, 2019 e 2020 somaram 16% das publicações, enquanto 2018 teve 17% (Figura 2a). Portanto, nota-se tendência de aumento no número de publicações, o que pode refletir aumento de interesse em compreender como as populações de pequena escala percebem as MC.

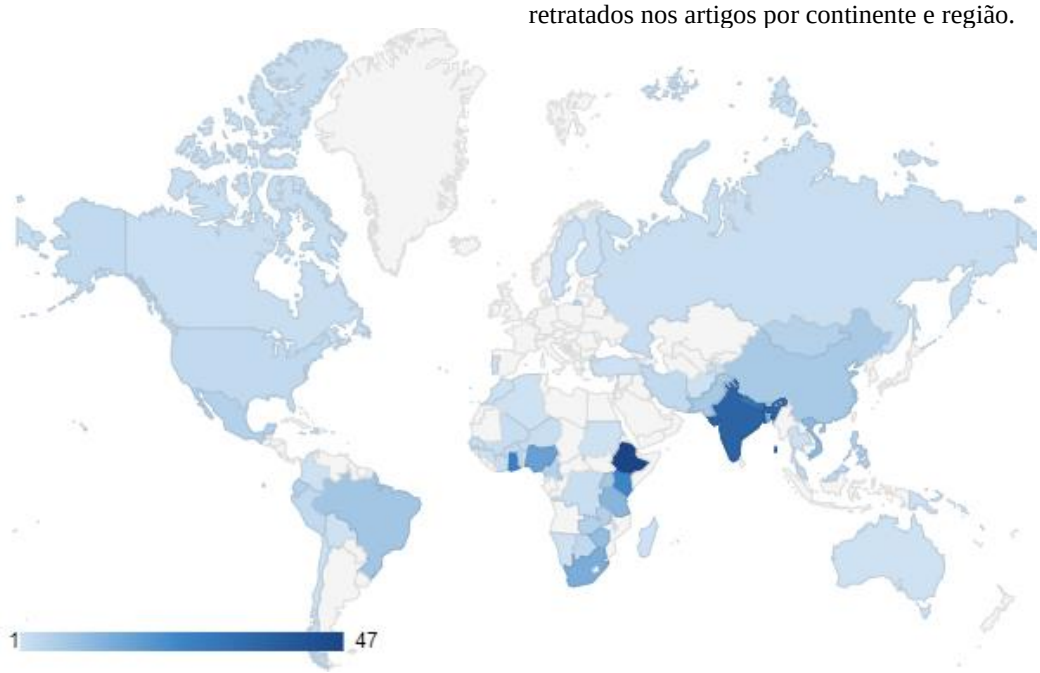
Figura I.2 - Características dos 361 artigos incorporados no mapeamento



(2a) Número de artigos publicados entre 2018 a 2022.



(2b) Distribuição geográfica dos 361 artigos por continente e região. A porcentagem indica a quantidade de países retratados nos artigos por continente e região.



(2c) Distribuição geográfica dos 361 artigos por país, com quantidade relativa. A escala varia de 1 a 47 artigos, sendo o número 1 representado pela coloração azul mais clara, e conforme se aproximam dos 47 artigos, a coloração de azul se torna mais escura.

Entre os 361 artigos, a quase totalidade (97%, n=353) incluiu um único país, enquanto somente cinco publicações (1,38%) trataram de dois países e três (0,83%) incluíram três. Os continentes foram representados de forma desigual, com grande concentração de artigos relativos às populações de pequena escala na África e Ásia (Figura 2b), respectivamente 54% e 35%. Os países mais estudados no continente africano com populações de pequena escala foram Etiópia (n=47), Gana (n=25), Quênia (n=24), Nigéria (n=17), África do Sul (n=14) e Tanzânia (n=12). Na Ásia, esta ordem incluiu a Índia (n=36), Nepal (n=29), Bangladesh (n=14), Vietnã (n=11), Paquistão (n=7) e China (n=7) (Figura 2c). É provável que esses dois continentes tenham sido muito retratados (em 54% e 35% dos 361 artigos) por duas razões. Primeiro por apresentarem populações dentre as mais pobres do mundo, altamente dependentes das condições climáticas para a prática das atividades de subsistência, além da alta vulnerabilidade aos eventos climáticos extremos e mudanças no clima (KAZI *et al.*, 2022; WORLD BANK, 2020). Estima-se que os dois continentes enfrentarão mudanças mais severas, como anomalias na temperatura, aumento do nível do mar, derretimento das geleiras e inundações (WMO, 2022a). Moçambique, Bangladesh, Paquistão e Nepal, por exemplo, estavam entre os dez países do mundo mais afetados por eventos climáticos extremos entre 2000 e 2019 (ECKSTEIN; KUNZEL; SCHAFER, 2021). Na África, já houve um aumento da temperatura de 0,3ºC/década entre 1991-2021 e, consequentemente, muitos países têm enfrentado secas extremas, como é o caso da Etiópia e Quênia (WMO, 2022b, 2022c, 2022a). De fato, este fator deve ter contribuído para redução de 34% na produtividade agrícola na África desde 1961 (WMO, 2022b). Segundo, o alto número de artigos pode refletir um viés de amostragem devido a alguns países terem grupos de pesquisas e/ou parcerias com instituições estrangeiras focadas no estudo de MC.

Continentes e regiões menos estudados com população de pequena escala no período foram: a Europa, com Rússia[8] (n=2), Finlândia, Suécia e Bósnia-Herzegovina (ambos com n=1); Oceania, com Samoa (n=2), Vanuatu, Papua-Nova Guiné, Austrália, Ilhas Salomão e Tonga (todos com n=1) e América Central, com Haiti, Jamaica, além de São Vicente e Granadinas (todos com n=1). Na América do Sul, os países mais investigados foram Brasil (n=8), Equador (n=5) e Colômbia (n=5) e, na América do Norte, México (n=5), Estados Unidos (n=3) e Canadá (n=2) (Figura 2c).

[8] A Rússia localiza-se em dois continentes (Europa e Ásia). Aqui aparece como parte do continente europeu, pois no Codebook consta como: "*transcontinental - generally considered European*".

Pela revisão acima, alguns países que abrigam populações de pequena escala não foram alvo de estudos, resultado que diverge do esperado pelo número de comunidades deste tipo que existem nesses países. Por exemplo, existem sete povos indígenas na Nicarágua e oito na Costa Rica, enquanto 12% da população do Panamá e 44% daquela da Guatemala são autóctones (IWGIA, 2022). Esperávamos também mais estudos em países que foram investigados, como o Brasil, pois existem 305 povos indígenas identificados, assim como na Bolívia, onde 48% da população é indígena, embora boa parte em áreas urbanas, e no Peru, onde vivem quatro milhões de indígenas também em condições diversas (IWGIA, 2022).

Há quatro razões plausíveis para explicar o porquê da inexistência desses estudos na nossa amostra. A primeira razão refere-se à impossibilidade de realizar muitas pesquisas entre 2019 e 2022 por conta da pandemia de covid-19 (LOKHTINA et al., 2022; RASHID; YADAV, 2020). Como segunda razão, alguns dos locais habitados por povos indígenas e populações tradicionais são de difícil acesso (e.g., o povo indígena Wayana na Guiana Francesa e Suriname, Tiriyó no Suriname (GRUPIONI, 2021; MORGADO; BARBOSA, 2021), assim como populações na Groelândia (IWGIA, 2022). Terceiro, pesquisadores podem evitar certas localidades, muitas vezes isoladas, devido a ameaças e riscos associados a práticas ilegais, como a mineração nas proximidades de Terras Indígenas (e.g., Guiana) (IWGIA, 2022) ou guerras e conflitos violentos no período de levantamento, como no Sudão do Sul (ONU, 2018), Israel e Palestina (IWGIA, 2022), Síria, Iraque, Ucrânia, Somália, Chade, Líbia, Iêmen e Arábia Saudita (GALLAS, 2022). Quarto, alguns países da Europa, onde há populações de pequena escala não apresentaram artigos provavelmente devido, talvez, ao menor interesse científico de se estudar populações tradicionais europeias do que as existentes em países em desenvolvimento[9], visto que os impactos negativos potenciais com as primeiras são muito menores (Figura 2c).

5.2. Características gerais das populações investigadas

Dos 361 artigos, quase dois terços (70%, n=252) tratou de populações de pequena escala não indígenas que habitam áreas rurais (não urbanas; e.g., *farmer*, *smallholder*, *small-scale*, *small-scale fisher*/*hunter*). Cerca de um terço (27%, n=99) abordou povos indígenas que habitam áreas

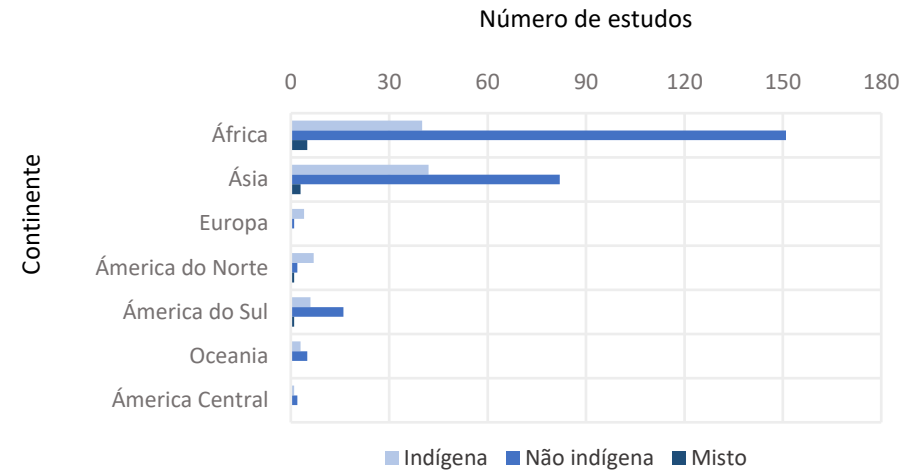
[9] Considerando aqui como populações tradicionais europeias não apenas as populações incluídas em um conceito mais restrito/étnico de populações indígena (e.g., povos indígenas Saami e Inuit), mas também as populações pertencentes a um conceito mais amplo de "*indigenous peoples and local communities*", que existem em diversos contextos rurais europeus.

rurais, referidos nos artigos como indígenas (*indigenous people*), nativos (*natives, native people*), autóctones (*autochthonous*), aborígenes (*aboriginal*) e populações étnicas (*ethnic*). Apenas 3% (n=10) dos artigos compreendiam tanto populações indígenas como não indígenas. Com exceção dos continentes europeu e americano, os dados indicaram que populações não indígenas foram mais frequentemente estudadas do que aquelas indígenas (Figura 3a).

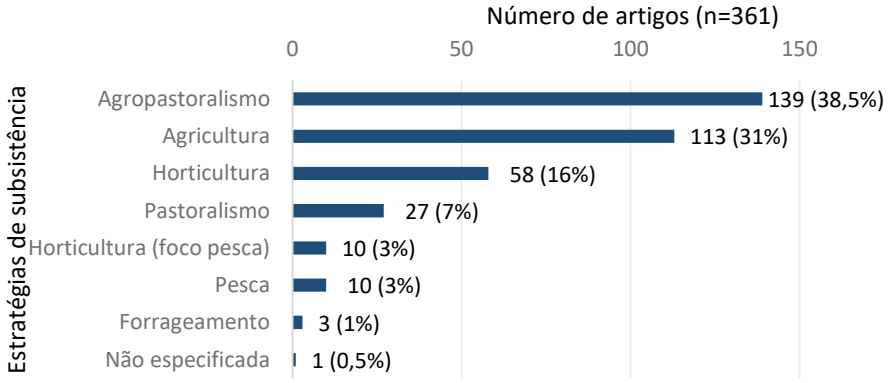
As estratégias de subsistência mais comuns nas populações estudadas (indígenas, não indígenas e em ambas) foram o agropastoralismo (combinação de agricultura e pastoralismo; 38,5%, n=139), seguido da agricultura de pequena escala (31%, n=113), horticultura (16%, n=58) e pastoralismo (7%, n=27). A atividade menos investigada nos artigos foi o forrageamento (1%, n=3) (Figura 3b), por exemplo, em populações como os caçadores-coletores indígenas Twa na República Democrática do Congo (BATUMIKE *et al.*, 2022); Inuit no Canadá (SANSOULET *et al.*, 2020) e cinco etnias diversas nos Estados Unidos (Quinault, Siletz, Salish Kootenai, Shivwits Band of Paiutes, Shoshone) (CHISHOLM HATFIELD *et al.*, 2018).

Entre populações indígenas encontrou-se o mesmo resultado, com exceção apenas da horticultura (7%, n=27) que foi mais frequente do que a agricultura de pequena escala (4%, n=16), situação que reflete as práticas descritas para os povos indígenas ao redor do mundo (IWGIA, 2022). Já para não indígenas, a agricultura de pequena escala (26%, n=93) foi menos praticada que o agropastoralismo (27%, n=98). Novamente, o resultado segue o esperado, pois 78% da população mais pobre do mundo, habitante de áreas rurais, depende da agricultura e do pastoralismo para subsistência (WORLD BANK, 2014). (Figura 3c).

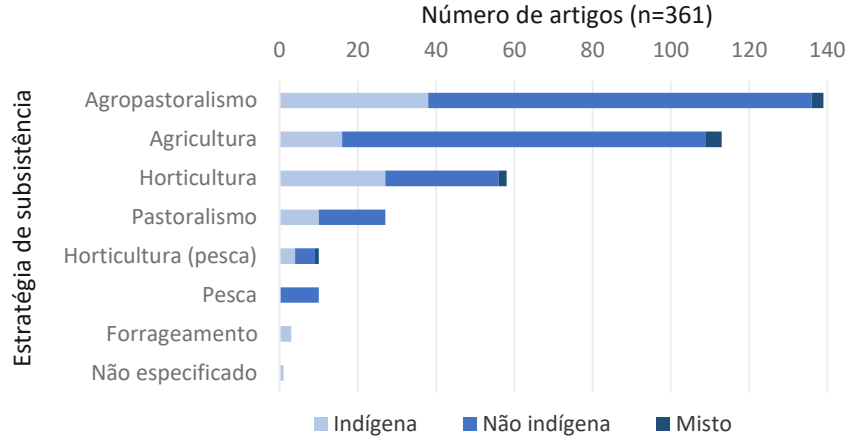
Figura I.3 - Características da população investigada: origem e estratégia de subsistência



(3a) Origem da população por continente.



(3b) Estratégias de subsistência descritas nos artigos.



(3c) Estratégia de subsistência adotada segundo a origem da população investigada.

5.3. Áreas temáticas

Todos os 361 artigos sobre percepção das MC compreendiam mais de um tema. Como esperado, em 97% dos artigos (n=349), as mudanças ambientais (e.g., aumento da seca) e os impactos resultantes dessas mudanças foram abordados. Porcentagem quase igual (94%) tratou dos efeitos das mudanças nos modos de vida (*livelihood*[10]) de comunidades de pequena escala, ou seja, na capacidade dos indivíduos de suprirem as necessidades básicas de sobrevivência como água, alimentos, abrigo, roupas, dentre outras (n=340). A adaptação às mudanças foi tratada por cerca de dois terços dos artigos, portanto, cifra menor, mas também bastante substancial (74% dos artigos; n=267). Os temas menos citados foram questões de gênero (2%, n=7), saúde e segurança alimentar (3%, n=10), vulnerabilidade (7%, n=26), mitigação dos efeitos das mudanças (12%, n=44) e percepção de risco (13%, n=46) (Tabela I.2).

Embora os números tenham sido próximos, a temática de conhecimento tradicional foi mais abordada entre não indígenas (n=56 ou 50%) do que indígenas (n=53 ou 47%) (Figura I.4). Do total dos artigos sobre conhecimento tradicional (n=112), 39% ou 44 artigos trataram de indicadores físicos e/ou biológicos provenientes da observação do ambiente. Por exemplo, estudo entre indígenas (e.g., na Bolívia (BAUER; DE JONG; INGRAM, 2022), África do Sul (KOM *et al.*, 2022), Namíbia (INMAN; HOBBS; TSVUURA, 2020)e Vietnã (KIEU *et al.*, 2020)), e entre não indígenas como, por exemplo, no Zimbábue (MUGAMBIWA; RUKEMA, 2020), México (METCALFE *et al.*, 2020), e Nigéria (FITCHETT; EBHUOMA, 2018) apresentaram conhecimento tradicional sobre preditores climatológicos variados como: precipitação, tempestade, seca, ano de muito calor e/ou frio, além de inundações através de indicadores atmosféricos (nuvem, vento), astronômicos (fase da lua, posição das estrelas) e biológicos (flora e fauna).

[10] "*A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stress and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base"*. (Disponível em: https://www.unisdr.org/files/16771_16771guidancenoteonrecoveryliveliho.pdf).

Figura I.4 - Área temática por origem da população investigada

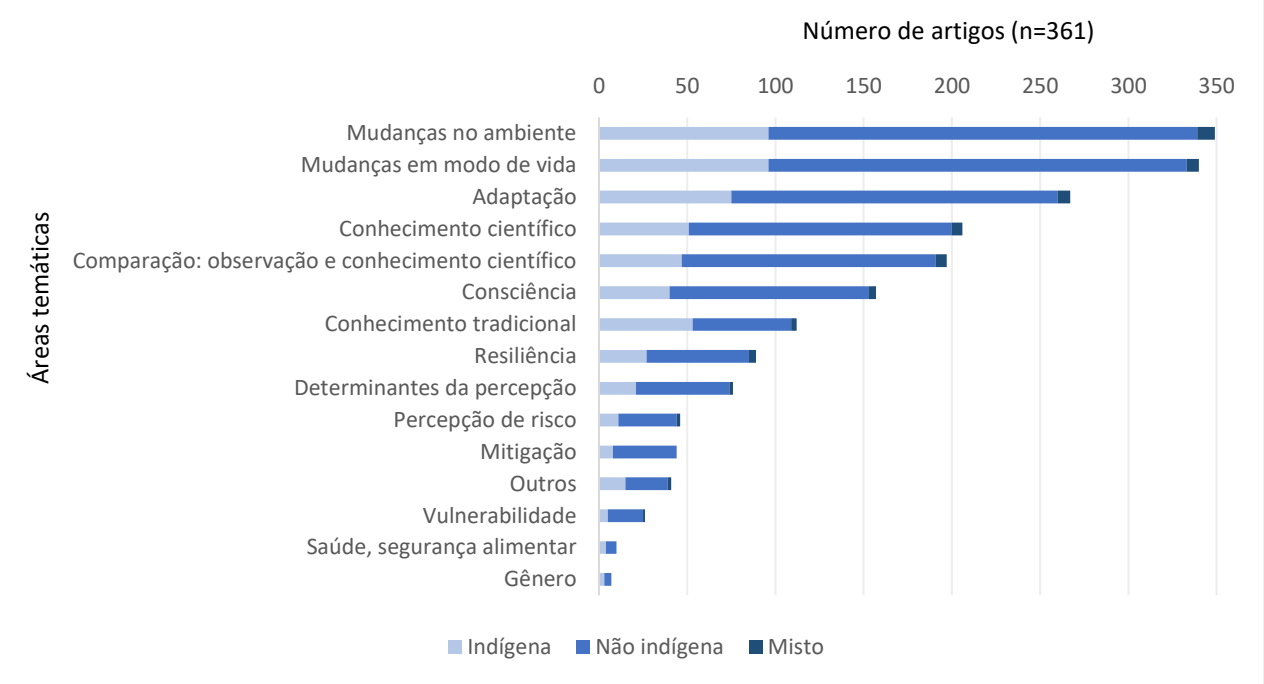


Tabela I.2 – Porcentagem das áreas temáticas abordadas nos 361 artigos

Área temática abordada no artigo	**Proporção e frequência (% (n))**	**Exemplos**	**Exemplos de referências**
Mudanças observadas no ambiente; e.g., a descrição dessas mudanças e os impactos ambientais resultantes.	97% (349)	Mudanças observadas no ambiente.	(AYINDE *et al.*, 2022; KHANAL *et al.*, 2019; KUNIYAL *et al.*, 2021; LUDAGO; AMANUEL, 2018; MEKUYIE; MULU, 2021; SAMUEL; ADENIYI; ADETUNJI, 2018)
		Impactos ambientais das MC.	(ANTENEH, 2022; BELAY *et al.*, 2022; DAWADI *et al.*, 2022; KHANAL *et al.*, 2019; MEKUYIE; MULU, 2021; PANDEY *et al.*, 2018; POPOOLA; MONDE; YUSUF, 2018)
Mudanças observadas nos modos de vida através: (i) descrição de mudanças e seus impactos na vida das pessoas (e.g., produtividade agrícola, renda monetária etc.) ou (ii) aspectos essenciais para a sobrevivência humana.	94% (340)	Mudanças e impactos nos modos de vida através da *Sustainable livelihoods approach* (SLA): analisando capital (humano, social, físico, natural e financeiro).	(BAUER; DE JONG; INGRAM, 2022; GUÁQUETA-SOLÓRZANO; POSTIGO, 2022; MONWAR *et al.*, 2018; NDLOVU; PRINSLOO; LE ROUX, 2020; QUANDT, 2019; TORRES *et al.*, 2022; YIRIDOMOH *et al.*, 2021; ŽUROVEC; VEDELD, 2019)
		Mudanças e impactos nos modos de vida sem analisar o capital (humano, social, físico, natural e financeiro).	(KIESLINGER *et al.*, 2019; KUPIKA *et al.*, 2019; LUDAGO; AMANUEL, 2018; MASHARA, 2018; MONWAR *et al.*, 2018; NEF *et al.*, 2021; SAALU; ORIASO; GYAMPOH, 2020; SINGH *et al.*, 2020; TUGJAMBA; WALKERDEN; MILLER, 2021)
		Mudanças e impactos nos modos de vida através da percepção do risco climático.	(SHARMA; JAGTAP; RAO, 2022)
Adaptação, desde medidas, iniciativas, estratégias de enfrentamento (adotadas ou planejadas) para reduzir ou prevenir efeitos adversos atuais	74% (267)	Determinantes da adaptação (e.g., educação, experiência, percepção das MC, informação, etc.).	(BALOCH; TAN; FAHAD, 2022; CECI *et al.*, 2021; FUNK *et al.*, 2020; GUODAAR; APPIAH, 2022; KANGAI *et al.*, 2021; MESFIN; BEKELE, 2018; MUSAFIRI *et al.*, 2022; VO; MIZUNOYA; NGUYEN, 2021; ZELEKE *et al.*, 2022)
		Adoção de diversas medidas de adaptação	(CUNI-SANCHEZ *et al.*, 2019; KOUASSI; WANDAN; MBOW, 2022; LANDAVERDE *et al.*, 2022; PANDEY *et al.*, 2018; RAI; DAHAL; ANUP, 2022; TIMITÉ *et al.*, 2022; TWECAN *et al.*, 2022)

Área temática abordada no artigo	Proporção e frequência (% (n))	Exemplos	Exemplos de referências
e/ou esperados das MC independem do ator que as implementa.		*Ecosystem-based Adaptation approach*	(INMAN; HOBBS; TSVUURA, 2020; KUPIKA *et al.*, 2019)
		Climate smart agriculture	(ADHIKARI; RAWAL; THAPA, 2022; ALI, 2021; AUTIO *et al.*, 2021; BELAY *et al.*, 2022; MAIRURA *et al.*, 2021; MOUTOUAMA *et al.*, 2022; NYANG'AU *et al.*, 2021)
		Coping strategies	(AHMED; ATIQUL HAQ, 2019; GEBEYEHU *et al.*, 2021; KANWAL; SIROHI; CHAND, 2021; LIMUWA *et al.*, 2018; MEKUYIE; MULU, 2021; STAUB *et al.*, 2020; TUNDE; AJADI, 2019)
Conhecimento científico: apresentação de dados meteorológicos, físicos ou quaisquer tipos de informações coletadas por cientistas e pesquisadores.	57% (206)	Apresentação de dados meteorológicos (e.g., tendência, dados históricos de temperatura, precipitação).	(BEHAILU *et al.*, 2021; CUNI-SANCHEZ *et al.*, 2019; DATTA; BEHERA, 2022; FUNATSU *et al.*, 2019; HAMAL *et al.*, 2022; JOSHI *et al.*, 2019; MKONDA; HE; FESTIN, 2018; MUBIRU *et al.*, 2018)
Comparação entre observação dos indivíduos investigados e dados científicos como meteorológicos sobre variabilidade climática e/ou anomalias climáticas.	55% (197)	Comparação entre percepção dos indivíduos e dados meteorológicos.	(ABAZINAB; DUGUMA; MULETA, 2022; BEHAILU *et al.*, 2021; DARABANT *et al.*, 2020; KAMRUZZAMAN *et al.*, 2022; MKONDA; HE; FESTIN, 2018; MURINGAI; MAFONGOYA; LOTTERING, 2022; OCAK YETISGIN *et al.*, 2022; PARAMESH *et al.*, 2022; ROY *et al.*, 2021)
Consciência (*awareness)*, i.e. estado ou capacidade de	44% (157)	Consciência sobre as MC	(ADO *et al.*, 2019; HUNDERA; MPANDELI; BANTIDER, 2019; JIBRILLAH; JAAFARA; CHOY, 2018; NG'OMBE; TEMBO; MASASI, 2020; OCAK YETISGIN *et al.*, 2022; PONDORFER, 2019)

Área temática abordada no artigo	Proporção e frequência (% (n))	Exemplos	Exemplos de referências
perceber, sentir ou estar consciente sobre os eventos, objetos ou padrões sensoriais relativos às MC.		Fatores afetando a consciência (e.g., educação, experiência, acesso à informação, renda monetária, etc.).	(ADO *et al.*, 2019; PONDORFER, 2019)
Conhecimento tradicional	31% (112)	Conhecimento tradicional: a identificação de indicadores físicos (e.g., nuvens, posição das estrelas, aspectos atmosféricos) e/ou biológicos (e.g., comportamento animal, florescimento de plantas, presença de insetos), ou outros.	(INAOTOMBI; MAHANTA, 2019; MALIKI; PAULINE, 2022; MEKONNEN *et al.*, 2018; TUME; KIMENGSI; FOGWE, 2019)
		Conhecimento tradicional sem identificação de indicadores.	(ESTEVO *et al.*, 2022; KUPIKA *et al.*, 2019; MIARA *et al.*, 2022; TUMENJARGAL *et al.*, 2020; WYLLIE DE ECHEVERRIA; THORNTON, 2019)
Resiliência, i.e. a capacidade dos sistemas sociais, econômicos e ambientais de responderem ou enfrentarem eventos perigosos, tendências ou quaisquer distúrbios para manter funções, identidades e estruturas essenciais, enquanto mantêm capacidades de adaptação, aprendizado e transformação.	25% (89)	Resiliência de capital (humano, social, físico, natural e financeiro).	(MONWA *et al.*, 2018a; QUANDT, 2019)
		Resiliência de sistemas socioecológicos	(CÓRDOBA VARGAS; HORTÚA ROMERO; LEÓN-SICARD, 2020)
		Resiliência nos modos de vida	(AL DIRANI *et al.*, 2021; METCALFE *et al.*, 2020; SHARMA; JAGTAP; RAO, 2022)
		Resiliência sobre impactos das MC (e.g., seca).	(BAHTA, 2021; BAIG *et al.*, 2021; HABTE *et al.*, 2022)

Área temática abordada no artigo	Proporção e frequência (% (n))	Exemplos	Exemplos de referências
Fatores determinantes da percepção, como idade, sexo, escolaridade, renda monetária, acesso à informação, dentre outros.	21% (76)	Determinantes da percepção (e.g., idade, sexo, acesso à informação; acesso ao crédito, tamanho da unidade doméstica, etc.).	(AWOKE; AGITEW, 2022; DATTA; BEHERA, 2022; ESCARCHA *et al.*, 2018; FADAIRO; WILLIAMS; NALWANGA, 2020; GUODAAR; BARDSLEY; SUH, 2021a; HASAN; KUMAR, 2022; HOANG, 2020; NEGI *et al.*, 2021; SRAKU-LARTEY *et al.*, 2020; XIE *et al.*, 2022)
		Determinantes da percepção de risco (e.g., sexo; experiência).	(BUDHATHOKI *et al.*, 2020a; KANWAL; SIROHI; CHAND, 2021; MAGALHÃES *et al.*, 2021; SMITH, 2018)
Percepção de risco, i.e. o julgamento subjetivo das pessoas, comunidade, ou unidade doméstica sobre características e gravidade dos impactos das MC.	13% (46)	Percepção de risco climático.	(ADO *et al.*, 2020; BALOCH; TAN; FAHAD, 2022; GUODAAR; BARDSLEY; SUH, 2021b; ISLAM *et al.*, 2021; KANWAL; SIROHI; CHAND, 2021; NGUYEN-THI-LAN *et al.*, 2021; PANDEY *et al.*, 2019; RAIHAN *et al.*, 2021; SMITH, 2018; TIET; TO-THE; NGUYEN-ANH, 2022; TWECAN *et al.*, 2022)
		Climate-Related Risk Perception Index; Climate Change Risk Perception Index.	(AHMED *et al.*, 2021; FAISAL *et al.*, 2021; LIKINAW; BEWKET; ALEMAYEHU, 2022; MAMUN *et al.*, 2021)
		Percepção de risco climático a partir da *Prospect Theory.*	(VILLACIS; ALWANG; BARRERA, 2021)
		Gênero e percepção de risco.	(GRAZIANO; POLLNAC; CHRISTIE, 2018)
Mitigação, referindo-se a mudanças tecnológicas e/ou outros tipos de substituições que reduzam emissões de GEE ou que atuem na redução desses gases e aerossóis.	12% (44)	Estratégia de adaptação para mitigar impactos adversos das MC.	(ADO *et al.*, 2020; ROY *et al.*, 2021)
		Estratégia de mitigação.	(ABERA; TESEMA, 2019; CHIDIEBERE-MARK *et al.*, 2019; FAISAL *et al.*, 2021; MAIRURA *et al.*, 2021; SAMUEL; ADENIYI; ADETUNJI, 2018)
Outros temas	11% (41)	Produtos florestais não-madeireiros.	(GURUNG *et al.*, 2021b, 2021a)

Área temática abordada no artigo	Proporção e frequência (% (n))	Exemplos	Exemplos de referências
		Turismo	(SAARINEN *et al.*, 2020; SHIJIN, 2021)
		Prospect theory, heurística, barreiras psicológicas, memória, modelo mental, cogeração de conhecimento.	(DAKURAH, 2021; EITZINGER; BINDER; MEYER, 2018; HAAG *et al.*, 2021; SHARMA; JAGTAP; RAO, 2022; VILLACIS; ALWANG; BARRERA, 2021; WALDMAN *et al.*, 2019b)
		Área de floresta; uso da terra; agrobiodiversidade; agrofloresta, agricultura de conservação, valores ambientais;	(BAFFOUR-ATA; ANTWI-AGYEI; NKIAKA, 2021; BAUL *et al.*, 2022; ISLAM *et al.*, 2021; NJERU *et al.*, 2022; PAUDEL *et al.*, 2022; RASMUS *et al.*, 2021)
		Cultivo de vegetais, cultivo de açaí.	(CHEPKOECH *et al.*, 2018; EKEMINI-RICHARD; AYANWALE; ADELEGAN, 2020; FADAIRO; WILLIAMS; NALWANGA, 2020; TREGIDGO *et al.*, 2020)
		El Niño; furacão, peste, incêndio florestal, doença animal, perigo criosférico, choque climático.	(AYAL *et al.*, 2018; CAVOLE *et al.*, 2020; METCALFE *et al.*, 2020; PANDEY *et al.*, 2019; PHOPHI; MAFONGOYA; LOTTERING, 2020; SHERPA *et al.*, 2019; VINOKUROVA; SOLOVYEVA; FILIPPOVA, 2022)
		Pobreza	(SOLANGI *et al.*, 2022; TORRES *et al.*, 2022)
		Governança climática, gestão de risco, confiança na instituição.	(BEKELE; ABEBE, 2019; MUGAMBIWA; RUKEMA, 2019; TIET; TO-THE; NGUYEN-ANH, 2022)
		Espécies-chave (*keystone*); eventos fenológicos, serviços ecossistêmicos de mangues.	(FITCHETT; EBHUOMA, 2018; NYANGOKO *et al.*, 2022; WYLLIE DE ECHEVERRIA; THORNTON, 2019)
		Sistema socioecológico.	(BAUER; DE JONG; INGRAM, 2022; RAMÍREZ; IBARRA, 2019)
		Crença religiosa	(SCOVILLE-SIMONDS, 2018)

Área temática abordada no artigo	Proporção e frequência (% (n))	Exemplos	Exemplos de referências
		Qualidade da água; programas de desenvolvimento de bacias hidrográficas.	(FUNK *et al.*, 2020; GODEBO *et al.*, 2021)
Vulnerabilidade, i.e., predisposição dos indivíduos, comunidade, unidade doméstica de serem adversamente afetadas pelas MC.	7% (26)	Avaliação de vulnerabilidade (*Climate Vulnerability Index*)	(AHMED *et al.*, 2021; EVARISTE *et al.*, 2018; FAISAL *et al.*, 2021; JAMSHIDI *et al.*, 2019; LIMUWA *et al.*, 2018)
		Contexto de vulnerabilidade em MC.	(ALMUDI; SINCLAIR, 2022; DAS; MISHRA, 2022; KIESLINGER *et al.*, 2019; MALIKI; PAULINE, 2022; TWECAN *et al.*, 2022)
		Nível de vulnerabilidade	(OLABANJI *et al.*, 2021)
		Matrix de vulnerabilidade	(BACHA; NAFEES; ADNAN, 2018; CHAUDHARY *et al.*, 2021)
		Livelihood vulnerability index	(OWUSU *et al.*, 2021; REHMAN; AZHONI; CHABBI, 2022)
		Vulnerabilidade baseada em gênero	(DAWIT; DINKA; HALEFOM, 2022)
Saúde, segurança alimentar, nutrição.	3% (10)	Influência das MC na saúde	(LUMBORG *et al.*, 2021; NNADI; AMADI, 2019; SORGHO *et al.*, 2020)
		Saúde mental	(ALFARO; CORTÉS, 2020)
		(In)segurança alimentar	(AL DIRANI *et al.*, 2021; DAS; MISHRA, 2022; KANWAL; SIROHI; CHAND, 2021; NGURE *et al.*, 2021; OBWOCHA *et al.*, 2022)
		Nutrição de crianças	(SORGHO *et al.*, 2020)
		Padrão de consumo alimentar	(GHOSH-JERATH *et al.*, 2021)
	2% (7)	Gênero, prática da atividade de subsistência e estratégia de adaptação.	(LIMUWA; SYNNEVÅG, 2018)

Área temática abordada no artigo	Proporção e frequência (% (n))	Exemplos	Exemplos de referências
Questões de gênero relacionadas à percepção das MC.		Gênero e influência na percepção de risco, consciência, e estratégia de adaptação.	(GRAZIANO; POLLNAC; CHRISTIE, 2018)
		Gênero e percepção das MC.	(DAWIT; DINKA; HALEFOM, 2022; DIARRA *et al.*, 2021; KIUMBUKU; BAARU; MUTINDA, 2018; QUANDT, 2019)
		Mulheres e percepção das MC, consciência e estratégia de adaptação.	(ADDANEY; SARPONG; AKUDUGU, 2021; LAWSON *et al.*, 2020)

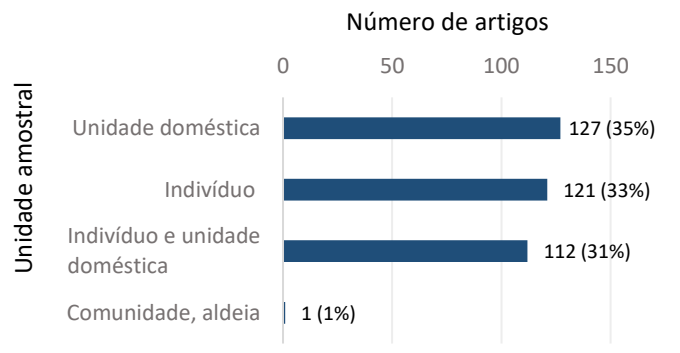
5.4. Métodos utilizados nos artigos

Em mais da metade das publicações (61%, n=222), os dados utilizados nas análises incluíram tanto aqueles primários como secundários, enquanto nos restantes (39%, n=139) foram utilizadas apenas informações primárias (i.e. coletadas com a própria população estudada). Os dados secundários vieram, por exemplo, de estações meteorológicas (e.g., BOM; TIEFENBACHER; BELBASE, 2022; HAMAL et al., 2022; KIMARO; MOR; TORIBIO, 2018; MALIKI; PAULINE, 2022; REDDY et al., 2022; SAALU; ORIASO; GYAMPOH, 2020), avaliação de precipitações a partir de imagens de satélites (e.g., FUNATSU et al., 2019), dados oficiais de governos (e.g., BATISTA et al., 2020), informações de censos (e.g., KEVLA et al., 2022) ou de revisão da literatura (e.g., CHIMI et al., 2022; SAALU; ORIASO; GYAMPOH, 2020). Relembra-se que não foram encontradas publicações apenas com dados secundários, pois um dos critérios para inclusão dos artigos, era conter dados primários.

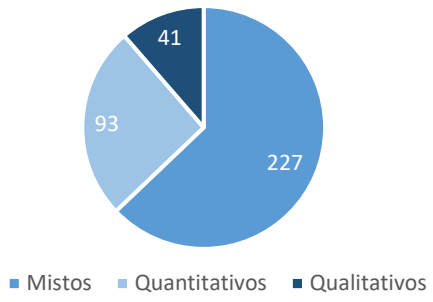
A unidade amostral adotada com maior frequência pelos artigos foi a unidade doméstica (i.e. *household*; 35%, n=127), embora proporção muito similar de artigos focou no indivíduo (33%, n=121) e a maioria dos restante nesses dois níveis (Figura 5a). Exceção a estes foi, por exemplo, o estudo de Salvadeo (SALVADEO *et al.*, 2021), que investigou a comunidade como unidade amostral.

Quanto à metodologia empregada, abordagens de métodos mistos (qualitativos e quantitativos) estiveram presentes em maior proporção das publicações (63%; n=227), enquanto cerca de um terço utilizou apenas métodos quantitativos (26%; n=93) (Figura 5b). Ao analisarmos conjuntamente a natureza dos métodos empregados (quantitativo, qualitativo, misto) e o tipo de dados utilizados (primários, primários e secundários) (Figura 5c), observa-se que, além de mais frequente, o mais usual (n=160) é que sejam utilizados dados primários e secundários nas investigações com métodos mistos.

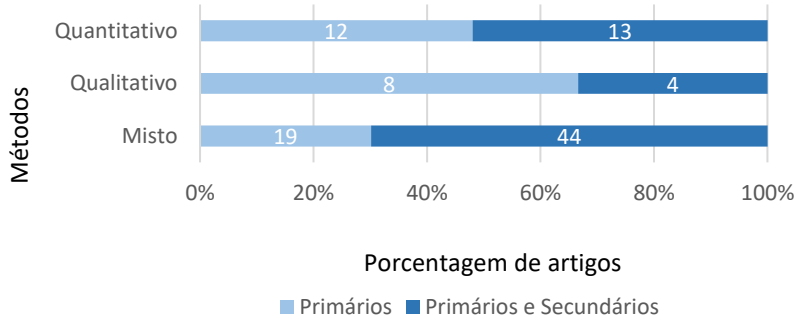
Figura I.5 - Proporção e número de artigos (sobre a barra) com diferentes abordagens metodológicas (n total= 361)



(5a) Unidade amostral dos 361 artigos.



(5b) Métodos dos 361 artigos.



(5c) Distribuição do método por tipo de dados utilizados.

5.5. Abordagem teórica dos artigos

No total dos 361 artigos foram encontradas 18 teorias em 43 deles (Tabela I.3), indicando um baixo aprofundamento teórico desta literatura. Maior porcentagem dos artigos (88%) não são embasados em teorias, ao menos citadas de forma explícita no artigo. Entre aqueles que utilizam alguma teoria no texto, esta não é usualmente avaliada nos resultados, com exceção de *frameworks* teóricos como *Capital Approach Framework.* Entre os que citam teorias, observa-se que não existes teorias que predominam na literatura de MC, sendo que algumas foram citadas de forma apenas pontual (e.g., *Integral Theory, Grounded Theory, Norgaards Theory of Denial).* Além disso, nem todo artigo que adotou uma teoria explicitou o conceito de percepção. Porcentagem baixa do total de artigos (4%, n=15) continham ao menos uma teoria e a definição de percepção no mesmo artigo.

A maior parte das teorias faz parte das disciplinas de Psicologia (35%) e Economia (23%), enquanto menor proporção é multidisciplinar (12%). Ressalta-se que proporção pequena dos

artigos revisados identificou explicitamente ao menos uma teoria (10% do total de artigos, n=36). Dos 361 artigos, 2% deles (n=7) apresentaram mais de uma teoria (ADAAWEN, 2021; GUODAAR; BARDSLEY; SUH, 2021ª; KANNAN; BESSETTE; ABIDOYE, 2022; KOIRALA; KOTANI; MANAGI, 2022; NKUBA *et al.*, 2022; SHARMA; JAGTAP; RAO, 2022; VILLACIS; ALWANG; BARRERA, 2021).

Dentre as linhas teóricas citadas, tiveram maior destaque os vieses cognitivos (*cognitive biases*), sendo abordados em 16 artigos, e Teorias da Escolha Racional, particularmente a Teoria da Utilidade Esperada, adotada em oito artigos (~18% dos artigos). Os vieses cognitivos foram tratados nesses artigos como possíveis barreiras psicológicas para uma correta percepção, avaliação de risco climático e tomada de decisão pelos indivíduos. Outras teorias foram adotadas para explicar a percepção das MC ou a percepção de risco, dentre as quais, a Teoria Cultural, os modelos cognitivos, a abordagem *Perceptual Geography*, a Teoria do Comportamento Planejado e o modelo *Private Proactive Adaptation to Climate Change*. A Teoria da Utilidade Esperada foi utilizada para compreender como o indivíduo escolheria uma estratégia de adaptação visando maximizar a utilidade dessa escolha, podendo ser, por exemplo, maior lucro, diminuição dos impactos das MC ou maior benefício da estratégia.

Já o comportamento dos indivíduos frente ao risco climático foi explicado através da Teoria do Prospecto. A Teoria da Motivação de Proteção também abordou sobre o risco climático, mostrando que o comportamento poderia afetar qual estratégia de adaptação seria aderida pelo indivíduo. Outras teorias também abordaram as estratégias de adaptação, dentre as quais o *Climate Change Response Model*, que relacionou a adoção de estratégias com a vulnerabilidade e a percepção dos indivíduos as MC. Já a *Capital Theory* avaliou a relação entre percepção e a disponibilidade de ativos adaptativos (capital humano, físico, financeiro, social e natural) com as estratégias de adaptação.

Os resultados indicam que, considerando todas as teorias citadas nos artigos revisados, é mais comum que sejam adotadas explicações sobre as barreiras para a percepção e sobre as estratégias de adaptação a partir de teorias psicológicas e racionais, com exceção dos vieses cognitivos e da Teoria do Prospecto, cuja explicação é não racional.

Tabela I.3 – Informações sobre as teorias que foram apresentadas nos artigos (n=361)

Nome da teoria	Disciplina da teoria	Descrição de como a teoria foi utilizada ou citada no artigo	Referências	Proporção e frequência (% (n))
Cognitive biases (Vieses cognitivos)	Psicologia	Argumenta sobre a importância da abordagem sociocognitiva na tomada de decisão através da junção dos padrões de dados físicos com a experiência e os pontos de vista dos indivíduos.	(BEDEKE *et al.*, 2018)	4% (16)
		Argumenta que o viés (*social desirability)* é uma possível resposta para os entrevistados terem descrito as MC como mais problemática durante as oficinas do que nas entrevistas. Discute que o viés pode levar os participantes a responderem seguindo a opinião de outros participantes ou de pessoas que teoricamente conheceriam sobre o assunto (como cientistas, políticos, etc.).	(NEF *et al.*, 2021)	
		Argumenta que a cognição e a emoção levam a vieses em como as pessoas avaliam o risco.	(ENSOR *et al.*, 2018)	
		Discute a influência da intuição e da emoção na tomada de decisão, além de como o viés cognitivo muitas vezes não é considerado.	(SMITH, 2018)	
		Mostra evidência de um viés cognitivo em relação à percepção das chuvas por agricultores.	(WALDMAN *et al.*, 2019b)	
		Discute heurísticas como um viés cognitivo.	(WALDMAN *et al.*, 2019a)	
		O artigo chama atenção para o atraso em aprofundar e considerar os sistemas socioculturais e cognitivos que moldam a avaliação local dos riscos e respostas às MC.	(ADAAWEN, 2021)*	
		Discute a dificuldade dos indivíduos de entenderem cognitivamente o termo MC, seus impactos e estratégias de adaptação.	(NNKO et al., 2021*; SHIJIN, 2021)	
		Discute a importância de juntar dados científicos com dados de percepção subjetiva, para evitar que ocorram vieses, e.g., vieses heurísticos.	(BEHAILU et al., 2021*; GUODAAR; BARDSLEY; SUH, 2021a)	
		Argumenta que o viés do *status quo* explicaria o motivo de algumas pessoas desconsiderarem os efeitos das MC.	(VILLACIS; ALWANG; BARRERA, 2021)*	
		Apresenta a heurística de disponibilidade como exemplo para referir-se a percepções que não estão em concordância com os dados meteorológicos.	(KANNAN; BESSETTE; ABIDOYE, 2022)	
		Argumenta que as heurísticas e os vieses têm efeito na percepção das MC. Apresenta em resultados evidências de que as heurísticas em educação podem	(NKUBA *et al.*, 2022)	

Nome da teoria	Disciplina da teoria	Descrição de como a teoria foi utilizada ou citada no artigo	Referências	Proporção e frequência (% (n))
		ser um dos fatores que afetam as percepções, além de apresentar na discussão evidências dos vieses cognitivos.		
		Apresenta as barreiras psicológicas para a tomada de decisão, como o viés da aversão à perda e viés da assimilação.	(SHARMA; JAGTAP; RAO, 2022)	
		Apresenta que fatores econômicos e cognitivos são importantes para adaptação, portanto, utiliza nas análises tanto fatores cognitivos, como os não cognitivos.	(KOIRALA; KOTANI; MANAGI, 2022)*	
Prospect Theory (Teoria do Prospecto)	Economia comporta-mental	Teoria utilizada para ver o comportamento de agricultores em relação a percepção de risco de MC.	(VILLACIS; ALWANG; BARRERA, 2021)*	0,55% (2)
		Teoria utilizada para investigar os seus efeitos na percepção das MC. Argumenta que os pastoralistas seriam mais sensíveis as perdas devido aos riscos climáticos das secas.	(NKUBA *et al.*, 2022)	
Protection Motivation Theory (Teoria da Motivação de Proteção)	Psicologia	Apresenta a relação entre percepção de risco e adaptação. Os indivíduos tomariam medidas de precaução através de dois processos cognitivos: avaliação de ameaças e avaliação de enfrentamento.	(BUDHATHOKI *et al.*, 2020a)*.	1% (4)
		Apresenta que os processos cognitivos levam os indivíduos a se motivarem através da proteção dos eventos climáticos extremos das MC.	(BUDHATHOKI *et al.*, 2020b)*.	
		O estudo é conceituado com base nessa teoria, portanto, o comportamento do indivíduo frente ao risco depende da sua capacidade de lidar e avaliar a ameaça.	(POUDYAL *et al.*, 2021)	
		Apresenta que fatores econômicos e cognição podem influenciar na estratégia de adaptação das pessoas.	(KOIRALA; KOTANI; MANAGI, 2022)*	
Cultural Theory (Teoria Cultural)	Antropo-logia	Explica como os indígenas compreendem as MC, segundo a sua visão de mundo, partindo do princípio de que os indivíduos se enquadrariam em quatro premissas de solidariedades: fatalista, individualista, hierarquista e igualitarista.	(AMBROSIO-ALBALA; MAR DELGADO-SERRANO, 2018)	0,28% (1)
Cognitive models: mental models of climate change	Psicologia	Apresenta como o indivíduo enxerga as MC. Os modelos mentais seriam representações cognitivas da realidade, na qual observação e experiência do indivíduo contribuem para essa representação.	(ADAAWEN, 2021)*	0,28% (1)
Climate Change Response Model	Multi-disciplinar	O modelo é utilizado para conceitualizar as MC e a relação com a vulnerabilidade e os impactos advindos delas. O modelo vincula a vulnerabilidade, a percepção das MC, os impactos nos meios de subsistência de pequenos agricultores, as estratégias de adaptação aderidas e as mudanças nos processos de tomada de decisão.	(MALIKI; PAULINE, 2022)	0,28% (1)

Nome da teoria	Disciplina da teoria	Descrição de como a teoria foi utilizada ou citada no artigo	Referências	Proporção e frequência (% (n))
Model of Private Proactive Adaptation to climate change	Psicologia	Informa que a pesquisa segue o modelo desenvolvido por Grothmann & Patt (2005), para entender como as pessoas avaliam os riscos e examinar o que afeta a percepção de risco. Apresenta dois processos para conceituar a percepção de risco: a avaliação de risco e avaliação de adaptação.	(SHERPA *et al.*, 2019)*.	0,55% (2)
		Apresenta o modelo para argumentar que fatores econômicos e a cognição podem influenciar na estratégia de adaptação das pessoas.	(KOIRALA; KOTANI; MANAGI, 2022)*.	
Theory of Rational Choice - Expected Utility Theory (Teoria da Escolha Racional – Teoria da Utilidade Esperada)	Economia	Apresenta em métodos (*analytical framework*), assumindo que os agricultores são racionais e escolhem a estratégia de adaptação para maximizar a utilidade.	(ADDIS; ABIRDEW, 2021)	2% (8)
		Argumenta que a escolha de qual estratégia de adaptação adotar, depende da utilidade esperada dos agricultores e da condição socioeconômica. Utiliza a teoria em métodos, no modelo econométrico.	(ALI, 2021)	
		Compara a teoria com a *Prospect Theory*.	(VILLACIS; ALWANG; BARRERA, 2021)*	
		Apresenta em métodos (*analytical framework*) de modo implícito, argumentando que os agricultores aderem uma nova tecnologia quando a utilidade (lucro) é maior do que a dos métodos tradicionais.	(SINGH *et al.*, 2022)	
		Sugere que os agricultores têm informações suficientes sobre as probabilidades e impactos/consequências de um evento de risco.	(RAIHAN *et al.*, 2021)*.	
		Apresenta em análise de dados (modelo econométrico), para examinar o que influencia na escolha de adaptação, pressupondo que o indivíduo busca maximizar a utilidade (e.g., maior benefício da estratégia).	(MAMUN et al., 2021*; MEGERSA et al., 2022)	
		Apresenta a teoria como exemplo para referir-se a percepções que não estão em concordância com os dados meteorológicos.	(KANNAN; BESSETTE; ABIDOYE, 2022)	
Random Utility Maximization Theory ou *Random Utility Model* (Teoria da Maximização da Utilidade Aleatória)	Economia	Avalia se a percepção dos agricultores sobre as MC teve influência na adaptação às MC.	(MUTANDWA; HANYANI-MLAMBO; MANZVERA, 2019)	0,80% (3)
		Conceitualiza qual estratégia de adaptação seria adotada, a partir da utilidade percebida pelo indivíduo.	(AYANSA; BEDEMO; JARA, 2021; WALE; NKOANA; MKUNA, 2022)	

Nome da teoria	Disciplina da teoria	Descrição de como a teoria foi utilizada ou citada no artigo	Referências	Proporção e frequência (% (n))
Integral Theory (Metatheory)	Multi-disciplinar	Teoria é citada em métodos (coleta de dados) para apresentar que a pesquisa quantitativa precedeu a fase qualitativa.	(GUODAAR; BARDSLEY; SUH, 2021b)	0,55% (2)
		Argumenta em métodos que a teoria integral extrai o conhecimento de diferentes perspectivas para entender as questões ambientais.	(GUODAAR; BARDSLEY; SUH, 2021a)	
Behavioral Decision-Making Theory (Teoria da Racionalidade Limitada)	Economia	Em um contexto econômico, indica que os tomadores de decisão são racionalmente limitados e reagem de forma diferente às ameaças e oportunidades. Argumenta que as percepções dos indivíduos de curto e longo prazo das MC podem levar a comportamentos diferentes de adaptação.	(YANG *et al.*, 2021)*.	0,55% (2)
		Apresenta brevemente a teoria da racionalidade limitada para dizer que ela junto da Teoria do Prospecto contém vieses cognitivos.	(NKUBA *et al.*, 2022)	
Theory of Planned Behavior (Teoria do Comportamento Planejado)	Psicologia	A teoria é utilizada para explorar a percepção e as respostas de adaptação. Três fatores foram usados no contexto das MC: crenças comportamentais (*attitude* em relação ao comportamento), crenças normativas (normas subjetivas) e crenças de controle (controle comportamental). Quando juntos, eles originariam a intenção comportamental e teriam relação com a teoria da autoeficácia (*self-efficacy theory*).	(JELLASON *et al.*, 2019)	0,55% (2)
		Aplicou a teoria para conceituar a percepção dos agricultores rurais e o controle comportamental sobre a mudança e variabilidade climática, analisando as *attitudes* em relação ao comportamento, as normas subjetivas e controles comportamentais percebidos, além da adoção de uma estratégia de adaptação.	(BELAY et al., 2022)*	
Value-Believe-Norm Theory (Teoria do valor-crença-norma)	Psicologia	Discute o impacto das crenças no comportamento dos indivíduos influenciados por fatores psicológicos como crenças, preocupação, percepção e *attitude* em relação às MC.	(TIET; TO-THE; NGUYEN-ANH, 2022)	0,55% (2)
		Apresenta a teoria como framework teórico para analisar a percepção dos indivíduos e o seu comportamento adaptativo em relação as MC. Analisa, portanto, a confiança, as crenças climáticas, a percepção de risco e a adaptação.	(PENG et al., 2022)*	
Teoria/explica-ção local engendrada pelo método de	Ciências Sociais em geral	Apresenta que a coleta de dados foi conduzida considerando a própria teoria, i.e. primeiro há a coleta e análise de dados, para então elaborar uma teoria	(MUGAMBIWA; RUKEMA, 2020)	0,28% (1)

Nome da teoria	Disciplina da teoria	Descrição de como a teoria foi utilizada ou citada no artigo	Referências	Proporção e frequência (% (n))
"grounded theory"				
Perceptual Geography Approach	Geografia	Argumenta que a experiência do indivíduo pode afetar a percepção, sugerindo que a percepção e observação de pastores sobre o ambiente variaria conforme as diferentes experiências de vida.	(RASMUS *et al.*, 2021)	0,28% (1)
Capital Approach Framework ou Capital Theory (Teoria do Capital)	Economia	Examina a relação entre as percepções dos agricultores e seus ativos adaptativos (capital humano, físico, financeiro, social e natural) nas estratégias de adaptação.	(NGUYEN-ANH *et al.*, 2021)*.	1% (4)
		Argumenta que o conhecimento tradicional faz parte da teoria de capital social.	(MALIAO *et al.*, 2022)	
		Examina o impacto das MC nos cinco capitais (social, cultural, natural, físico e econômico) e o uso desses capitais em estratégias de adaptação.	(GUÁQUETA-SOLÓRZANO; POSTIGO, 2022)	
		Caracteriza os modos de vida, a partir de cinco formas de capital (humano, físico, financeiro, social e natural). Com base na teoria, as características humanas, sociais, naturais, físicas e financeiras foram determinadas, e outras sete variáveis foram consideradas para avaliar a percepção e disposição para aceitar as ações de mitigação e de adaptação.	(TORRES *et al.*, 2022)*.	
Norgaards theory of denial	Psicologia e Sociologia	Argumenta que a negação das MC é a incapacidade de integrar o conhecimento sobre elas na vida cotidiana ou transformá-la em ação social. Portanto, a má adaptação ocorreria em decorrência da negação sobre o problema (mesmo que saiba sobre as MC não toma nenhuma ação) e da falta de conhecimento.	(SHARMA; JAGTAP; RAO, 2022)	0,28% (1)

Nota:* indica os artigos que apresentaram uma definição explícita do conceito de percepção.

5.6. Definição explícita de percepção e constructos de percepção

Dos 361 artigos, apenas 20% (n=73) adotaram alguma definição explícita do conceito de percepção e 4% (n=15) apresentaram uma definição teórica ao longo do artigo (ver Tabela I.3), ou seja, fundamentada em alguma teoria das Ciências Humanas ou Sociais. Como esperado, observou-se de 2018 para 2022 um aumento de 12% (n=9) para 30% (n=22) no uso de conceitos explícitos nos artigos publicados (Figura 6a). Dentre os artigos que explicitaram sua definição, a grande maioria apresentou o conceito somente na introdução (80%, n=58), enquanto uma menor quantidade somente nos métodos (8%, n=6), ou nos resultados (8%, n=6) e discussão (4%, n=3).

As definições explícitas encontradas nos artigos foram divididas em sete grupos, cujos critérios de inclusão são explicitados na Tabela I.4. Esses grupos representam o contexto principal da definição explícita adotada. Cada definição foi colocada em um grupo considerando a sua característica principal, sendo que uma definição poderia ser enquadrada em mais de um grupo. Todas as definições explícitas encontradas constam na Tabela I.5.

Tabela I.4 – Descrição dos critérios para inclusão em um dos sete grupos de percepção.

Grupos das definições de percepção	**Critérios para inclusão no grupo**
Percepção de risco	Definir percepção como percepção de risco, podendo utilizar os termos: *risk perception(s)* ou *perception of risk*.
Consciência (*awareness)*	Definir a percepção através da consciência pelo uso das palavras: *awareness*, *climate change awareness*, *physiological* ou *psychological awareness*.
Percepção segundo constructos psicológicos, estímulos do ambiente e/ou sensoriais	Definir a percepção segundo a abordagem da Psicologia Cognitiva, fazendo menção aos constructos psicológicos, a percepção sensorial (ver, ouvir, experienciar, interpretar e organizar sensações, etc.), aos processos cognitivos ou as informações e estímulos recebidos.
Experiência prévia	Definir a percepção segundo a experiência prévia do indivíduo com as próprias MC ou com os efeitos advindos dos eventos climáticos extremos. Podendo estar descrita como experiência pessoal, experiência vivida, interpretação das experiências do ambiente ou experiência social.
Observação das variáveis climáticas	Definir a percepção através da observação das MC, da variabilidade climática, dos extremos climáticos ou do processando de dados brutos.
Crenças e interpretação do indivíduo sobre o ambiente	Definir a percepção como a interpretação de eventos climáticos, com base em crenças, experiências ou compreensão.
Incerteza e ameaça	Definir a percepção através da incerteza ou ameaça de um evento climático.

Tabela I.5 - Definições explícitas do conceito de percepção divididas por categorias (n=73 artigos)

Definição de percepção	Referências
1. Percepção de risco	
"Based on the IPCC's definition of "risk perception," we consider "perceptions of change" as "the subjective judgment that people make about the characteristics and severity of changes."".	(ALMUDI; SINCLAIR, 2022, p.27)
"Risk perceptions are beliefs about potential harm or the possibility of a loss. This is a subjective judgment that people make about the characteristics and severity of a risk. In the study, risk perception was considered to be a subjective judgment made by farmers regarding the characteristics and severity of the risks brought about by climate change."	(PENG et al., 2022, p.3)
"(...) Risk perception (i.e., person's subjective judgment or assessment of risk)".	(TIET; TO-THE; NGUYEN-ANH, 2022, p.4)
"(...) the perception of risk is a subjective judgement of the likelihood of a respective event such as flood, drought, cyclone, etc. and stakeholders' subsequent awareness of its level of damage. (...) The study defines hailstorm risk perceptions as concerns shown by farmers regarding previous, present, and future incidents of negative impacts on crop production and agricultural activities due to the occurrence of hailstorms".	(RAIHAN et al., 2021, p.4)
"Climate change risk perception is a multitask procedure that depends on different factors including socio-economic, demographic, political, and cultural activities. Overall, personal understanding leads to a pivotal role in identifying farmers' perceived climate-related risks".	(MAMUN et al., 2021, p.7)
"(...) perception of CC is a personal assessment that comprises an individual's understanding, which in turn motivates actions with respect to CC incidence and severity. Thus, an individual must perceive CC before responding to it, and this perception needs to be linked with actual CC for effective adaptation measures". (...) The perception of risk is a mental construct and personal perception may vary among individuals".	(FAISAL et al., 2021, p.2; p.9)
"Risk perceptions refer to a decision maker's assessment of the risk inherent in a situation. They are important determinants of decision maker behavior as studies have shown they can influence the assessment of uncertainty and distort one's judgments, knowledge, and the ability to perform under risky conditions. They are generally measured by asking about the perceived "seriousness," "concern," and/or "worry" of a situation". (...) In the psychology literature, perception refers to the process of receiving information and stimuli from one's surroundings and converting them into psychological responses. The perception of risk is, therefore, a mental construct that distinguishes between the existence of objective real-world threats and the subjective evaluation of those threats".	(VILLACIS; ALWANG; BARRERA, 2021, p.863-864)
"Risk perception is a mental construct and farmers' climate change risk perceptions are unique in a sense that it allows for a differentiation between the actual real-world hazards, for instance, climate change, and intuitive evaluation of those dangers".	(AHMED et al., 2021, p.5)
"Risk perception involves the "subjective assessment of the probability of a specified type of accident (or event) happening and how concerned we are with the consequences"".	(ADAAWEN, 2021, p. 2)
"(...) risk perception is the subjective assessment of the probability of a natural hazard occurring and the consequences of hazards activities (severity)".	(BUDHATHOKI et al., 2020b, p.2)

Definição de percepção	Referências
"Threat appraisal, also known as risk perception, is the primary cognitive process assessing how an individual is threatened by a specific known risk consisting of perceived probability and perceived severity (the consequences)."	(BUDHATHOKI et al., 2020a, p.3215)
2. Consciência (*Awareness*)	
"Climatic perception is defined as a state of opinions and/or awareness toward the changes in climate variables."	(KOIRALA; KOTANI; MANAGI, 2022, p.189)
"The degree of awareness for climatic variabilities is time and space context-specific, which varies according to local communities' own experiences with their ecosystem. The preliminary knowledge of climate change comes from the direct observation of the environment and its physical consequences."	(DAS; MISHRA, 2022, p.5)
"Perception is the process of receiving information from the ambient environment and transforming it into physiological awareness for taking adaptation and mitigation strategies towards adverse impacts of climate change in the agroecological system. However, this process could vary with the individual's past experiences, observations, and present attitudes, needs, and social circumstances and also depending on one´s livelihood, literacy, and settlement."	(BAUL et al., 2022, p.2)
"According to the encyclopedia of qualitative research methods, perception is like a set of lenses through which an individual views reality. In this study, the perception of climate change was assessed through the frequency of "awareness" or "knowledge" of climate change and how the interviewees observe the changes in temperature, rainfall, and spatial–temporal distribution of rain."	(MOUTOUAMA et al., 2022, p.5)
"Climate change awareness involves creating knowledge, understanding and values, attitude, skills, and abilities among individuals and social groups towards the issues of climate change for attaining a better quality environment. (...) In this study, awareness of climate change including (i) conceptual awareness; (ii) experiential awareness; (iii) engagement awareness, and (iv) adaptation awareness. Conceptual awareness regards an individual's knowledge on the causes of climate change; their impacts and the necessity for a response. Experiential awareness concerns experiences and knowledge of long-term changes in climatic conditions and associated impacts on the availability of resources and livelihoods. Engagement awareness is about the frequency with which an individual talks or hears about climate change, while adaptation awareness refers to knowledge on climate forecasting, adaptation techniques and climate response policies."	(SEN et al., 2021, p.239-240)
"Farmers' perception of climate change was considered as an aggregated awareness about the trend of the following four climatic parameters (rainfall, temperature, number of rainy days and frequency of dry spells) generated from the historical climate records of the research area."	(RAPHOLO; DIKO MAKIA, 2020, p.575)
"Climate change perceptions are the process of receiving information from the environment and transform it into psychological awareness."	(MIHIRETU; OKOYO; LEMMA, 2020, p.3)
"Farmers' perception of climate change refers to an aggregated awareness of the trend in the climatic parameters such as rainfall, temperature, drought and onset and end of the rainy season."	(TESFUHUNEY; MBELETSHIE, 2021, p.117)
"A plethora of scholars define climate change perceptions as awareness of change in climatic conditions and their impacts on people's livelihoods."	(MUGAMBIWA; RUKEMA, 2020, p.731)

Definição de percepção	Referências
3. Percepção segundo constructos psicológicos, estímulos do ambiente e sensoriais	
"Recent literature revealed that climate change perception is a challenging process that involves psychological concepts, such as attitudes, beliefs, and concerns on how climate change is happening. Perception, in this case, refers to people's understanding of the reality and causes of climate change, its consequences, and the factors that determine the decision to apply appropriate measures."	(BELAY et al., 2022, p.2)
"Essentially, climate change and extreme events perception are complex processes that encompass a range of psychological constructs, such as knowledge, beliefs, attitudes, and concerns about whether and how the climate is changing."	(DAMTEW et al., 2022, p.3)
"Perceptions about CC are "a complex process that encompasses a range of psychological constructs such as knowledge, beliefs, attitudes, and concerns about if and how the climate is changing."	(LANDAVERDE et al., 2022, p.2)
"Perception refers to the process in which people receive information and stimuli from their environment and transform them into conscious psychological actions."	(TIMITÉ et al., 2022, p.5)
"It is fundamental to consider that the perception of climate change is a complex process that encompasses a variety of psychological constructs, such as the knowledge, beliefs, attitudes, and concerns about whether and how the climate is changing. Perception is influenced and shaped by, among other things, the characteristics of individuals, their experiences, the information they receive, and the cultural and geographic contexts in which they live."	(TORRES et al., 2022, p.13)
"Environmental perception is the response of the senses to environmental stimuli (sensory perception) and the mental activity resulting from the relationship with the environment (cognitive perception)."	(VASCONCELOS et al., 2022, p.15)
"Farmers' perception, which is a cognitive driving force."	(NGUYEN-ANH et al., 2021, p.3)
"Farmers' perception of climate variability is a complex process that includes a range of psychological constructs such as knowledge, beliefs, attitudes, and practices related to how the local climate has varied. Farmers' perception of climate variability is shaped by farm household characteristics, historical experiences with local climates especially the impact of climatic changes on agriculture productivity, the knowledge that they receive, socio-cultural and geographic contexts where farmers cultivate their fields. In this study, farmers' perception of climate variability was defined by their experiences during the decade which preceded the survey in Tharaka-Nithi County (2007-2017) regarding seven climatic characteristics and several consequences that they had experienced as a result of climate variability. These indicators included change in temperature, change in rainfall amounts, change in rainfall onset and rainfall cessation dates, change in length of the cropping season, and changes in flooding and drought frequency. The consequences of climate variability that shaped farmers' perceptions in Tharaka-Nithi County included changes in soil fertility and soil erosion risks, changes in agricultural productivity, and changes in natural and planted forest cover."	(MAIRURA et al., 2021, p.2)
"Perception has been defined as the process by which organisms interpret and organize sensation to produce a meaningful experience of the world; and that a person's perceptions are based on experiences with natural and other environmental factors that vary in the extent to which such perceptions are enabled. Farmers' perception of climate variability refers to their lived	(BEHAILU et al., 2021, p.2)

Definição de percepção	Referências
experiences about fluctuations in weather patterns (especially rainfall, temperature, and drought) and how that affected their livelihoods."	
"Perception is defined as a process of receiving information and stimuli from our surroundings and converting those into psychological responses. However, individual perception differs with time and situation and particularly, perception of climate change is a difficult idea for the farmers."	(RABBI et al., 2021, p.11051)
"Perception is a process in which stimulus or information is received and transformed to generate a psychological awareness. This stimulus is formulated based on cultural background, prior experience, and socioeconomic factors."	(KANGAI et al., 2021, p.168-169)
"In this study, perceptions about climate variability and other stressors were defined as an individual's ability to see, hear and experience (over the period 2000–2015) any one or combination of stressors caused by climatic phenomena alone and/or ecological, socio-economic and political factors affecting activities vital to the farmers' subsistence."	(SINGH et al., 2020, p.827)
"(...) farmers' perception refers to short-term experience relying on memories."	(ETANA et al., 2020, p.2)
"Perception is the process of receiving external stimuli and converting them into psychological responses based on past events and the present situation."	(FUNK et al., 2020, p.2)
"Perception is the first cognitive process through which the individual obtains information from the environment and allows the subject to form a representation of reality."	(ALFARO; CORTÉS, 2020, p.128)
"(...) public perception, defined as the process by which the public interprets and organizes sensation to produce a meaningful experience of the world (...)"	(ZHANG et al., 2019, p.1389)
"Van den Ban and Hawkins (2000) define perception as the process by which we receive information or stimuli from our environment and transform it into psychological awareness to produce meaningful experiences of the world."	(AHMED; ATIQUL HAQ, 2019, p.681)
"As pointed out by an anonymous reviewer, 'perception' and 'understanding' are sometimes synonymous. Yet, the Oxford Living Dictionary contains two distinct definitions of the word perception – 'The ability to see, hear, or become aware of something through the senses,' and 'The way in which something is regarded, understood, or interpreted.'"	(SCOVILLE-SIMONDS, 2018, p.346)
"Perception here follows the definition of Ndamani and Watanabe (2015) as the process by which organisms (humans) interpret and organise sensations to produce a meaningful experience of the world."	(CHEPKOECH et al., 2018, p.557)
"The perception framework is hinged around psychology, which is study of behaviour and mental processes. (...) perceptions are subjective and comprise a wide range of things which are contextual, value-laden and dynamic. For example, a definition of a similar event might be different within a group of individuals in with experience, i.e., how individuals react to situations. This is so because perception is a function of the actions displayed thereafter."	(LIMUWA et al., 2018, p.3)
"Perception of the environment describes how a person perceives the environment through the brain´s and their senses' ability to process and store information. The perceptual process is highly complex, but broken down it consists of six steps: the presence of objects, observation, selection, organization, interpretation, and response. The selection, organization, and interpretation is personalized and driven by internal and external factors. For example, the motivation, personality, or experience of an individual plays a role in how they perceive their surroundings, but also a continued repetition of being exposed to an object or a situation can alter their personal perception."	(RÖSCHEL et al., 2018, p.1)

Definição de percepção	Referências
"Perception to climate variability can be associated with both social-cultural construction and psychological dimensions. From a social cultural dimension perception it is systematically determined by how people who share a common culture interpret a phenomenon that affects their livelihoods and way of life. Psychologically, perceptions may vary from person to person or from group to group. However group differences in perceptions are often larger to result to predictive differences in perception between those groups. Such group dynamics may be due to gender, culture, livelihood activities, geographical locations, income age and level of education. (…) perception may be shaped by social variables that include culture, political and psychological factors since they all determine how people interact with the natural environment, including their livelihood practices."	(KIUMBUKU; BAARU; MUTINDA, 2018, p.1-2)
4. Experiência previa	
"The local perspective comprises perceptions of changing weather patterns, related traditional ecological knowledge (TEK), and experiences of an extreme precipitation event, which all influence local decision making in natural resource management matters."	(BAUER; DE JONG; INGRAM, 2022, p.2)
"In this sense, public perception of climate change can be interpreted in a temporal context. (...) In this sense, people's experiences of weather events over time form their perceptions. Therefore, public perception of climate change may relate to past experiences, current phenomena, and predictions of what will happen and how it will affect their lives."	(BOM; TIEFENBACHER; BELBASE, 2022, p.7)
"Perception is described as the process of creating experiential feelings in the real world and highlighting an individual's ability to take advantage of his experience of nature and natural variables."	(GHAZALI et al., 2021, p.16745)
"The theoretical context of climate change perception is built on observation, personal experience and information received from the surroundings/neighborhood over a period of time."	(DIARRA et al., 2021, p.13855)
"Perceptual geography is characterized by a common idea that experience affects perception, which leads to the conclusion that perceptions vary because individuals' life experiences differ. Perceptions are understood as points of contact between people and their environment and as a basis for spatial reasoning and decision making. Perception is the process that encodes the objective environment as a subjective one, with the subjective environment and past experiences influencing our behaviour and actions". (...) Perceptions also carry culture, and local and traditional knowledge. This means knowledge and practices, developed during centuries and handed down from generation to generation."	(RASMUS et al., 2021, p.3)
"(…) perception is mediated by and modified through interaction with the environment, historical background, and personal or lived experiences. In the context of climate change, perception is often studied as the process of acquiring information about one's environment and how it enhances climate awareness."	(MARTÍNEZ-HERRERA et al., 2021, p.350)
"Personal perception is what individuals perceive of the local climate instability, climate change and reactions, based on personal experience and values."	(SEREENONCHAI; ARUNRAT, 2019, p.10)
"Perception is a cognative process through which humans interpret experiences of the environment and in turn generate response strategies. Schlüter et al. (2017) highlights that in various behavioral models, perception is the initial receptor stage, i.e., "what comes in" and behavior is the final outcome, i.e., "what goes out.""	(SHUKLA et al., 2019, p.104)
"Local people's perception of rainfall behavior is an idiosyncratic manifestation of their experience and various environmental aspects."	(KAHSAY et al., 2019, p.2)

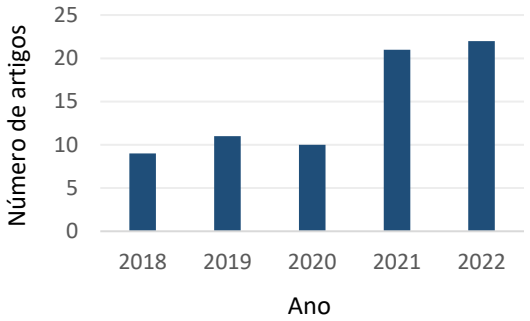
Definição de percepção	Referências
"Perceptions are complex and dynamic processes that are tied to social experiences and constitute a bridge between lived contexts and the environment."	CÓRDOBA VARGAS; HORTÚA ROMERO; LEÓN-SICARD, 2019, p.5-6)
"Slegers (2008) and Ejembi and Alfa (2012) add that human perceptions of environmental changes are informed by experiences of how the changes influence people's livelihoods."	(RANKOANA, 2018, p.367)
5. Observação das variáveis climáticas	
"(...) perceptions of climate change were defined as people's perspectives on local-scale changes in the state of weather-related factors, such as increased temperature, prolonged droughts, sea level rise, changes in precipitation patterns and large floods in a given area over the last decade, which if they persist over long periods of time become indications of climate change."	(NYANGOKO et al., 2022, p.3)
"Smallholder farmers perceptions of changes in both temperature and rainfall revealed that perceptions are made based on local environment and are not linked to an understanding of climate change and variability in the national or global contexts."	(TENDONKENG et al., 2022, p.6)
"The perceptions are usually understood by examining how climate variability (e.g., temperature and precipitation) and climate hazards (e.g., drought, storms, and floods) impact Indigenous livelihoods and wellbeing."	(PIMID et al., 2022, p.2)
"This paper used perception as a way of everyday and long-term interaction with the farmers to process raw data into actual trends."	(KOM et al., 2022, p.8)
"CCP (climate change perception) can be defined as the stage at which a household perceives changes in climatic conditions."	(OJO; BAIYEGUNHI, 2021, p.3)
"Farmers' perceptions consider farmers' observation of changes in climate and climatic events over a long period. Furthermore, perception refers to the practical knowledge rising from experience and concrete situations; and perception is also linked to local knowledge (...) In this paper, farmers' perception of climate change is defined as the farmers' perception of changes in the climate based on observation and individual experience in relation to the increase, decrease or no change in rainfall, temperature, and extreme weather events over a long period of time."	(MANH; AHMAD, 2021b, p.1190)
"Furthermore, perception is the practical knowledge arising from experiences and concrete situations; and perception is also linked to local knowledge. In this paper, farmers' perceptions of climate change are defined as the farmers' understanding of climate change based on observations and individual experiences in relation to the increase, decrease or status quo in rainfall, temperature and extreme weather events over a long period of time."	(MANH; AHMAD, 2021a, p.398)
"In this study, perception is defined as the way in which climate change and variability is regarded, understood, or interpreted by local people. Perception is of particular interest because of its ability to enhance solutions for risky climate events or otherwise."	(NNKO et al., 2021, p.1)
"We differentiate between perceptions of climate change in short and long term. Short-term perception is defined as the perception of extreme weather events in the past year, whereas long-term perceptions are perceived changes in temperature and rainfall over the last 20 years."	(YANG et al., 2021, p.4)
"Climate perception is a process by which individuals sense and realise changes in climate-related stimuli, where stimuli include changes in climate variables and extremes."	(CHAUDHARY et al., 2021, p.2)

Definição de percepção	Referências
"Perception is the way of processing raw data that a person receives through his/her daily and long-term interaction with immediate environment into meaningful pattern."	(TUME; KIMENGSI; FOGWE, 2019, p.5)
6. Crenças e interpretação do ambiente	
"Perception in this content entails the approaches through which the people understand their environment and so can utilise the environmental resources and acquire the capability to adapt to the stimuli that may arise from their interactions."	(EZEH; MADUKWE; EZEH, 2022, p.301)
"Perception research, according to Kamau, (2010) thus attempts to understand the complex interrelationships between man and the biosphere since man's actions and decisions concerning the environment are based on objective as well as subjective factors. Perception research is therefore concerned with how individuals or groups perceive their environment and how they react to changes in the environment. Perception is also about the beliefs an individual or a group have about an issue. Perception therefore forms the basis upon which knowledge is derived. (...) Perception therefore helps to determine the social or mental picture of climate change that individuals have and their beliefs about the effects of climate change."	(SRAKU-LARTEY et al., 2020, p.3-4)
"Climate change perceptions include the individuals' views and interpretations of the climate issue based on beliefs, experiences, and understanding."	(JAMSHIDI et al., 2019, p.155)
"Perception of climate variability is complex, and involves the opinions, beliefs, values and rules people have regarding climate change, which determine the orientation of their actions, in other words, whether they are positive or negative as regards adaptation."	(RAMÍREZ; IBARRA, 2019, p.79)
"Perception refers to the process concerned with the acquisition and interpretation of information from one's environment."	(ROY et al., 2018, p.4)
"We defined perceptions as the views and interpretations of the climate change issues based on beliefs, experiences and understanding."	(ESCARCHA et al., 2018, p.52)
"Human perception of the environment shapes and is shaped by human knowledge of the environment, and involves interpretation of events or information; therefore, any landscape consists of two basic elements, the biophysical components of an area affected by human activities and analyzed through "objective" analysis, and the perception and the value assigned to the environment by people, evaluated through "subjective" analysis."	(PANDEY et al., 2018, p.28)
7. Incerteza, ameaça	
"To farmers, climate change is not perceived in terms of major disasters, but rather as increased uncertainty, such as shifts in onset of rain at planting or end of rain at harvest."	(EKEMINI-RICHARD; AYANWALE; ADELEGAN, 2020, p.1)
"Perceived probability and perceived severity of a hazard are defined as a person's expectancy of being exposed to threats and how harmful the consequences of the threat would be if it were to actually occur, respectively."	(SHERPA et al., 2019, p.611)

Nota: CC=climate change. Referências inseridas dentro da definição foram removidas. Para mais detalhes consultar o Apêndice H.

Algumas palavras tornaram-se mais evidentes nas definições, entre elas, *awareness*, *experience(s)*, *process*, *knowledge*, *environment*, *risk*, *experience*, *information*, *psychological*, *subjective*, *beliefs*, *personal*, *understanding*, *stimuli* (Figura 6b). Esse resultado mostra que as definições de percepção em MC são muitas vezes uma junção de diferentes constructos da abordagem definida pela Psicologia Cognitiva (e.g., estímulo, consciência) com outros constructos, como experiência, crenças, conhecimento e entendimento.

Figura I.6 - Informações sobre as definições de percepção



(6a) Tendência temporal da frequência de uso da definição explicita de percepção.

(6b) Palavras presentes nas definições explícitas de percepção. Fonte: https://www.wordclouds.com/

Todos os 361 artigos apresentaram ao menos um constructo de percepção. Os constructos mais utilizados que definiram o conceito de percepção, seja de forma explícita ou implícita, foram exposição direta (99%, n=359) e a percepção segundo estímulos sensoriais (96%, n=345) (Tabela I.6). Um constructo que não foi utilizado em nenhum dos artigos foi "*consciousness*". C*onsciousness* é definido na Psicologia Cognitiva como o "estado de vigília, nossa capacidade de controlar nosso comportamento e estar ciente de nosso entorno, e nossas experiências mentais" (ANDRADE, 2012, p.583). Consiste em um conjunto multidimensional de constructos psicológicos, como crenças, atitudes, conhecimentos, valores e ação (comportamento) (JIMÉNEZ SÁNCHEZ; LAFUENTE, 2010; TRIANTAFYLLIDOU; ZABANIOTOU, 2022). Sinônimos de *consciousness* são preocupação ambiental ou consciência ambiental (JIMÉNEZ SÁNCHEZ; LAFUENTE, 2010). A consciência ambiental pode levar a um comportamento pró-ambiental nas MC, ou seja, indivíduos que têm consciência ambiental podem tomar ações que mitiguem, minimizem ou evitem os impactos adversos das MC. Possivelmente, a razão para a sua não inclusão foi que comportamentos pró-ambientais não são descritos quanto à percepção das MC, mas sim na adoção de estratégias adaptativas.

Ao menos na literatura de MC, os constructos que definem implicitamente o conceito de percepção parecem ir além de teorias da Psicologia Cognitiva, sejam *bottom-up* ou *top-down*. Isso porque, no caso da percepção das MC, foi encontrado na literatura que os constructos de percepção incluíram não somente os estímulos sensoriais, como seria esperado nas teorias *bottom-up*, e nem apenas o conhecimento prévio (no caso das MC por meio da exposição direta, indireta, conhecimento tradicional e científico), como previsto nas teorias *top-down*. Outros constructos poderiam estar presentes no conceito de percepção, como as crenças do indivíduo, o sentimento de preocupação, a percepção de risco, atitudes (no sentido de avaliação positiva ou negativa), diferentes visões de mundo e até mesmo a consciência (*awareness*) sobre as MC (Tabela I.6). Os resultados, portanto, confirmam a natureza interdisciplinar da área de MC, inclusive quanto ao conceito de percepção.

Entre os 361 artigos, todos continham ao menos dois constructos de percepção. Porém, não existem associações claras entre dois ou mais constructos; por exemplo, que o constructo de percepção está sempre associado àquele de consciência em um mesmo estudo. No entanto, há duas exceções.

Primeiro, o constructo de exposição direta esteve sempre presente com outros constructos, como aqueles de preocupação, exposição indireta, percepção de risco, *attitude* e visão de mundo. Essas associações podem sugerir: (i) que o indivíduo que percebe MC como preocupantes, provavelmente tenha vivenciado e sido exposto previamente a algum de seus efeitos; (ii) a percepção das MC viria tanto da experiência adquirida através de outras pessoas ou da mídia, como da própria vivência com as mudanças; (iii) a percepção de risco, i.e. o julgamento subjetivo sobre um risco climático provavelmente teria relação com ter vivenciado algum evento climático; (iv) a *attitude* e visões de mundo poderiam ser afetadas pela vivência e exposição com o evento climático.

Segundo, foi encontrado que os artigos que abordavam a percepção através do conhecimento científico também tratavam da percepção segundo estímulos sensoriais. Nessa abordagem, os estudos apresentam a relação entre ter conhecimento científico e perceber as MC a partir da visão da Psicologia Cognitiva.

Tabela I.6 - Informações sobre os constructos (n=361)

Nome e descrição do constructo	**Exemplos de como consta no artigo**	**Proporção e frequência (% (n))**
Exposição direta: vivenciar, observar ou ter contato direto com os efeitos das MC, como ondas de calor, mudanças de estações, invernos ou verões mais quentes, menos chuva, invernos mais amenos, menos neve, mudança em espécies animais ou vegetais (AKERLOF *et al*., 2013).	*"Perceptions are also associated with experience, i.e., how individuals react to situations."* (LIMUWA et al., 2018, p.3)	99% (359)
	"In Table 5, smallholder farmers' experiences of climate change are presented. The majority of the farmers have experienced late onset and early cessation of rainfall in the district as reported by 82.8% and 89.2% of respondents, respectively. (...) A vast majority of the smallholder farmers (94.7%) have also experienced decrease in the duration of rainfall while about 82.5% of the farmers have observed an increase in rainfall intensity." (ASARE-NUAMAH; BOTCHWAY, 2019, p.6)	
	"Disaggregated results show that perception varies with the region. A majority of respondents who had experienced most of the considered shocks came from the hill region (e.g., drought, untimely rain, irregular weather, hailstorm, etc.)." (PANDEY et al., 2019, p.9)	
	"In this study, farmers' perception of climate variability was defined by their experiences during the decade which preceded the survey in Tharaka-Nithi County (2007-2017) regarding seven climatic characteristics and several consequences that they had experienced as a result of climate variability. These indicators included change in temperature, change in rainfall amounts, change in rainfall onset and rainfall cessation dates, change in length of the cropping season, and changes in flooding and drought frequency." (MAIRURA et al., 2021, p.2)	
Percepção: "o conjunto de processos pelos quais reconhecemos, organizamos e damos sentido às sensações que recebemos de estímulos ambientais" (STERNBERG; STERNBERG; MIO, 2012, p.535). A percepção inclui a experiência sensorial, incluindo visão (observação), audição, tato, paladar, olfato e outros estímulos recebidos do ambiente. A pessoa interpreta os estímulos em algo significativo com base em experiências anteriores, conhecimentos e interpretações subjetivas da realidade (PIKE;	*"Majority of the respondents 72.5% in Dawu village were having a personal experience to judge the climate change issue while only 30% in Daiqian village have examined the climate change through personal observations (Table 7)."* (SHARIF et al., 2019, p.7998)	96% (345)
	"From Table 3, majority of the respondents (95.9%) had observed at least a change in one element of climate before while the remaining 4.1% had not observed any changes at all. (...) Majority of the respondents mentioned protracted drought, unpredictable rainfall pattern, high temperatures, strong winds and frequent flood events as observed changes in the climate, which negatively affects their agricultural venture."(ASANTE; GUODAAR; ARIMIYAW, 2021, p.6)	
	"Table 4 captures the respondents' perceptions of climate change in terms of observed changes in ecological processes." (CHANZA; MUSAKWA, 2022, p.8)	

Nome e descrição do constructo	Exemplos de como consta no artigo	Proporção e frequência (% (n))
EDGAR; EDGAR, 2012; STERNBERG; STERNBERG; MIO, 2012).	*"Most of the respondents (84.12%) felt the increase in temperature and the number of hot days."* (RAI; DAHAL; ANUP, 2022, p.8)	
Consciência (*awareness*): no contexto das MC é "o processo para perceber e entender as MC como um perigo, bem como aumentar a disposição de agir de forma comprometida e colaborativa para se adaptar e enfrentar os desafios das MC" (ITURRIZA et al., 2020, p.3). A consciência das MC compreende a percepção das MC como um problema e uma ameaça (ARLT; HOPPE; WOLLING, 2011).	*"The extent to which a community is aware of climate change refects its level of exposure to climate risks. The study reveals that 84.4% of the respondents were aware of climate change whereas 15.6% were not. Regarding livelihood strategies, farmers recorded the highest score of awareness (87.5%), followed by agro-pastoralists (78%). The level of awareness among Fulani people (92.9%) was higher than that of Hausa people (83.60%). In terms of gender, women (66.7%) were less aware than men (80.5%)."*(ADO et al., 2019, p.2969-2970)	53% (191)
	"As it is indicated in the Table 1, the majorities (90.3%) of the respondents reported that they have awareness about climate change in their communities while the remaining 9.7% of them have never come across and aware of the phrase climate change in their local communities." (HUNDERA; MPANDELI; BANTIDER, 2019, p.4)	
	"The data presented in Figure 5 has shown the responses of the pastoral communities about climate change perception. Responding to the question whether they know about climate change or not. 83.3% of the respondents belonging to Daiqian village were aware of the climate change issues while about 16.7% of the respondents were not aware of the climate change phenomenon at all. As compared to Daiqian, the pastoral community of the Dawu was less aware of the climate change. However majority of the respondents of Dawu village75% had the knowledge about climate change while 25% did not have awareness about climate change (Table 6)." (SHARIF et al., 2019, p.7997-7998)	
	"In the savannah, all the respondents (100%) were aware of changes in rainfall pattern and intensity. Nearly all of them (95.5%) were aware of changes in temperature and 78.5% of changes in heat levels. Similarly, in the rainforest, a large proportion of the respondents (92.5%) were aware of changes in rainfall patterns and 78.5% of changes in rainfall intensity. The majority were aware of changes in temperature (87.5%) and 67.5% of changes in heat levels. The high level of awareness of the indicators is connected with the temperature fluctuation observed from the trend analysis." (AKANO et al., 2022, p.8)	

Nome e descrição do constructo	Exemplos de como consta no artigo	Proporção e frequência (% (n))
Crença[11]: "uma convicção pessoal que não é necessariamente apoiada por evidências baseadas na ciência - mas que é moldada pelo contexto geral em que ocorrem, incluindo a compreensão científica que temos dela" (SOUSA-SILVA et al., 2016, p.2). Aspectos aprendidos na experiência ou na escola, ou mesmo equívocos e verdades incompletas que as pessoas acreditam serem crenças válidas (ARDOIN *et al.*, 2013).	*"People in the study area exhibit different perceptions on the causes of climate change. Although they were unanimous on the multiple causes of climate change, they however, differ in their ranking of these causes based on their degree of influence in changing the climate of the area. Figure 7 above, depicts this divergence of opinions. 39% of the respondents regarded climate change as something naturally caused by God."* (JIBRILLAH; JAAFARA; CHOY, 2018, p.75)	35% (125)
	"About 83% of the farmers were not aware of the term "climate change," yet the majority of the farmers (97%) believed that climate has certainly changed from what they recall of 20–25 years ago." (SHUKLA et al., 2019, p.111)	
	"Perception is also about the beliefs an individual or a group have about an issue."(SRAKU-LARTEY et al., 2020, p.3)	
	"In discussing the causes of CC, the farmers' responses aligned under two categories: CC is due to "Godly Actions" and/ or "Human Actions"." (SORGHO et al., 2020, p.5)	
Exposição indireta: o indivíduo está fisicamente distante da situação de MC e talvez esteja ouvindo, lendo ou visualizando o fenômeno em outra pessoa/local (HAMILTON-WEBB *et al.*, 2017). A experiência indireta pode incluir: (i) observar outro indivíduo e sentir o que ele sente, por meio de relatos de segunda ou terceira mão de pessoas conhecidas ou desconhecidas (experiência vicária) (PATON *et al.*, 2000), e (ii) vivenciar o fenômeno por meio de cobertura da mídia, jornais, televisão, internet (experiência virtual).	*"The results from the analysis also show that information from family and friends, and government significantly influence farmers' perception."* (ASARE-NUAMAH; BOTCHWAY, 2019, p.9)	28% (101)
	"The other factor contributing in the development of climate change awareness among pastoralist included Government Departments, weather forecast program, TV programs and multiple sources. Weather forecast program and TV program jointly contributed in developing perception among 13 (43%) and 16 (40%) of the respondents in Daiqian and Dawu respectively."(SHARIF et al., 2019, p.7998)	
	"Of the farmers that were aware of the term, climate change have acquired knowledge through camps mostly arranged by local NGOs." (SHUKLA et al., 2019, p.112)	
	"All farmers, except one, were introduced to CC through one of four sources: local radio show, informal discussions, provincial service agents, and their own experiences." (SORGHO et al., 2020, p.5)	
Conhecimento tradicional: "o conhecimento, as inovações e as práticas das comunidades indígenas e locais ao redor do mundo que estão	*"This means that they still rely significantly on their experiences based on personal physical observation of the environment. These ways of observing their natural world and harmonious ways of existing within this world has been passed along from*	23% (82)

[11] Embora tenha sido apresentado separadamente, a crença e visão de mundo também fazem parte do conhecimento tradicional.

Nome e descrição do constructo	Exemplos de como consta no artigo	Proporção e frequência (% (n))
profundamente enraizadas na história e na experiência" (IPCC, 2014, p.1774). Portanto, o conhecimento que: (i) tende a ser resultado de experiência e observação cumulativas, testadas no contexto da vida cotidiana; (ii) devolvidas por comunicação oral e engajamento repetitivo e não por instrução formal; (iii) dinâmico e adaptado às mudanças culturais e ambientais, e (iv) geralmente transmitido oralmente de geração em geração (IPCC, 2014).	*generation to generation throughout time using an oral tradition. For weather forecasting, local people have developed personal techniques involving the keen observation of various faunal and floral movements, as well as being uniquely attuned to other physical changes in their surroundings, recorded in Table 3."* (VAN HUYNH et al., 2020, p.8)	
	"During focus group discussions, it was evident that farmers in Nwanedi and Levubu have historically utilized a number of indigenous indicators for weather forecasts based on socio-cultural and environmental beliefs, but with limited documentation. During the field survey, major indicators employed by farmers for forecasting weather and climate change were analyzed." (KOM et al., 2022, p.9)	
	"Indigenous knowledge about climate change refers to understandings and philosophies developed by long-established nomad communities on climate change, and this knowledge has a strong link with the natural environment. (...) Thus, indigenous knowledge is referred to as traditional knowledge or local ecological perceptions, which has received much attention in climate change discussions and adaptation mechanisms." (GHAZALI et al., 2021, p.16745)	
	"Information obtained during the focus group discussion and interviews with key informants from both villages affirmed that farmers often use their local knowledge for weather predictions in helping them to take appropriate actions in response to an anticipated worse situation." (MALIKI; PAULINE, 2022, p.7)	
Preocupação: sentimento de preocupação com os resultados e consequências das MC (POORTINGA et al., 2019).	*"Whether people are concerned about climate change is a basic construct often attempted to explore in repeated national and international surveys. The current survey attempted to measure this important construct by asking farmers how much worried they are (instead of how much concerned they are) about climate change and its impacts."* (LONE et al., 2022, p.1748)	20% (74)
	"Almost all the fishermen who participated in the study expressed concern and fear about the increasing intensity of climate events and the resulting livelihoods insecurity over the years." (MADHANAGOPAL; PATTANAIK, 2020, p.3474)	
	"It is notable that Kashkoolis' awareness of climate change had become strong, although concern has been variable among households." (GHAZALI et al., 2021, p.16762)	

Nome e descrição do constructo	Exemplos de como consta no artigo	Proporção e frequência (% (n))
	"To facilitate dialog with informants during interviews about perceived risks from climate change, expressions such as "problems," "concerns," and "bad situations" were used as synonyms for "risk"." (MAGALHÃES et al., 2021, p.406)	
Percepção de risco: "julgamento subjetivo que as pessoas fazem sobre as características e gravidade de um risco" (IPCC, 2014, p.1772), neste caso, riscos associados às MC. O risco é frequentemente representado como a "probabilidade de ocorrência de eventos ou tendências perigosas multiplicada pelos impactos se esses eventos ou tendências ocorrerem. O risco de uma determinada pessoa ou comunidade resulta da interação de sua vulnerabilidade, exposição e perigo associado às MC" (IPCC, 2014, p.1772).	*"In this study, we introduced the Climate Change Risk Perception Index (CCRPI) for measuring char dwellers' climate change risk perception against any climatic events based on their personal experience".* (AHMED et al., 2021, p.3)	12% (45)
	"Risk perceptions about the climate consequences (i.e., perceived risk) often link to farmers' awareness about whether climate change will afect their farming activities in the future or not " (TIET; TO-THE; NGUYEN-ANH, 2022, p.4)	
	"In this study, we used the climate change risk perception index (CCRPI) for the calculation of livestock herders' perceptions of climatic events/variations that occurred during the past 10 years but rarely occurred previously." (FAISAL et al., 2021, p.5)	
	"The perception of risk is, therefore, a mental construct (Sjöberg, 2000) that distinguishes between the existence of objective real-world threats and the subjective evaluation of those threats. The subjective evaluation of threats can make climate change risk perceptions vary significantly among individuals." (VILLACIS; ALWANG; BARRERA, 2021, p.864)	
Attitude: "uma tendência psicológica que se expressa pela avaliação de uma determinada entidade com algum grau de favor ou desfavor" (CHAIKEN; EAGLY, 1993) em relação às alterações climáticas. "As *attitudes* têm um assunto, que pode ser um objeto, uma pessoa ou uma ideia abstrata"(ALBARRACIN; SHAVITT, 2018, p.300)	*"An understanding of the current level of knowledge, attitudes, and perceptions of farmers serve as an indicator of how well informed they are about climate change and how well-positioned they are to adopt climate change adaptation methods."* (AYANLADE; RADENY; AKIN-ONIGBINDE, 2018, p.320)	5% (17)
	"Climate change awareness involves creating knowledge, understanding and values, attitude, skills, and abilities among individuals and social groups towards the issues of climate change for attaining a better quality environment." (SEN et al., 2021, p.240)	
	"Essentially, climate change and extreme events perception are complex processes that encompass a range of psychological constructs, such as knowledge, beliefs, attitudes, and concerns about whether and how the climate is changing." (DAMTEW et al., 2022, p.3)	
	"It is fundamental to consider that the perception of climate change is a complex process that encompasses a variety of psychological constructs, such as the knowledge, beliefs,	

Nome e descrição do constructo	Exemplos de como consta no artigo	Proporção e frequência (% (n))
	attitudes, and concerns about whether and how the climate is changing." (TORRES et al., 2022, p.13)	
Conhecimento científico: "geralmente referindo-se ao conhecimento muitas vezes explícito que foi derivado da aplicação de métodos mais formais que visam aumentar o rigor em relação a diferentes posições sobre validade e confiabilidade. Isso inclui a pesquisa em ciências naturais e ciências sociais" (RAYMOND et al., 2010, p.1769).	*"Perceptions of these changes by rural communities are concentrated on observations of variations in temperature, rainfall, and vegetation patterns, which are often backed by blending such perceptions with scientifific evidence."* (TUME; KIMENGSI; FOGWE, 2019, p.2)	2% (8)
	"The colonial heritage and the influence of Catholicism in the Tequendama region (where this municipality is located) may explain the prevalence of religious aspects in the way of knowing and explaining the world and climate phenomena. This is also related to the limited access to scientific information, since only 3% of the participants have received any kind of training in the subject." (CÓRDOBA VARGAS; HORTÚA ROMERO; LEÓN-SICARD, 2019, p.11)	
	"At the beginning of each participatory community workshop, the fisheries and biodiversity group analyzed and evaluated the potential impacts of climate change on fishing activities and biodiversity, taking into account the available scientific evidence for climate change effects in the region (e.g. the information published in the Intergovernmental Panel on Climate Change's Fifth Assessment Report)." (SALVADEO et al., 2021, p.3)	
	"As the Tharu have not had access to any specific flooding prediction technologies, they have relied on their IK, as well as scientific weather forecasts. Tharu IK uses a combination of physical and biological indicators to predict extreme climate phenomena, such as excessive rainfall and droughts. (...) The Tharu have embraced 'hybrid knowledge' – a combination of Indigenous and scientific knowledge, technology and practice to increase yield and maximize profit as well as decrease vulnerability to extreme weather events." (CHAUDHARY et al., 2021, p.8)	
Visão de mundo: implica um conjunto coerente e amplo de valores relacionados a um aspecto particular da vida (KALBERG, 2004), neste caso, as MC. Considere a visão de mundo como o sistema de valores das pessoas que organizam e integram o que elas aprenderam sobre o mundo e sobre si mesmas (por exemplo, através da	*"The perceptions that emerged were interpreted according to the four worldviews proposed by cultural theory."* (AMBROSIO-ALBALA; MAR DELGADO-SERRANO, 2018, p.471)	2% (7)
	"How people perceive (in the broader sense of understand or interpret) climatic changes is shaped by their broader concerns and priorities and how they identify with particular groups. It is also founded on the ontological and epistemological underpinnings of their worldviews, which may differ significantly from the dominant understanding upheld by	

Nome e descrição do constructo	Exemplos de como consta no artigo	Proporção e frequência (% (n))
experiência) em um sistema de representação simbólica relacionado às suas visões sobre as MC (AERTS; VAN BELLE; VAN DER VEKEN, 2012).	*climate science and upon which mainstream responses to climate change are singularly based."* (SCOVILLE-SIMONDS, 2018, p.346)	
	"Perception of climate change hazards can vary between members of different ethnic groups due to different perceptions or world views." (QUANDT, 2019, p.3)	
	"The perception of the ecological system varies according to the worldview of each social system or ethnic group. (RAMÍREZ; IBARRA, 2019, p.93)	

De modo geral, a ampla maioria dos artigos (86%, n=312), descreveu a percepção (nos resultados, discussão ou conclusão dos artigos) como a observação das MC em aspectos ambientais específicos, através da percepção segundo estímulos sensoriais e consciência sobre os efeitos das MC. Dentre os aspectos ambientais citados estão a descrição da observação de eventos extremos ou anomalias na variabilidade climática. Esses podem ser tanto relatos individuais de mudanças frequentes observadas, ou então eventos ocasionais/pontuais, sejam incrementos ou reduções, em fatores como temperatura, precipitação, seca, e/ou indicadores biofísicos, quanto aqueles relativos a suas consequências, por exemplo, mudanças na floração de plantas. Nesses artigos, eventos "extremos" ou "anomalias" diziam respeito frequentemente a tempestades, deslizamentos de terra, tornados, incêndios florestais, secas prolongadas, onda de calor ou de frio intensos, geadas, raios, ciclones, furacões, vendavais ou inundações. Por exemplo, agropastoralistas (HAMAL *et al.*, 2022) e pastoralistas (NEUPANE *et al.*, 2022) do Nepal têm percebido que a temperatura aumentou significantemente no verão e a quantidade de neve diminuiu nas últimas décadas. Já agricultores relataram chuvas imprevistas, seca, inundação e ventos violentos (PAUDEL *et al.*, 2022). Indígenas no Zimbábue observaram que houve diminuição de frutos silvestres e, aumento de insetos em decorrência das MC (CHANZA; MUSAKWA, 2022). Enquanto que agricultores em Uganda reportaram aumento da temperatura e da seca, diminuição do período das chuvas, aumento de pestes, diminuição de árvores nativas e aumento da frequência e intensidade de eventos climáticos extremos (TWECAN et al., 2022).

Pequena porcentagem dos artigos (5%, n=18) descreveu a percepção (o que são as MC, suas causas e seus efeitos) utilizando o conhecimento tradicional das pessoas como preditor das condições climáticas, através do uso ou não de indicadores. Por exemplo, estudo mostrou que indígenas na Bolívia utilizam indicadores atmosféricos, astronômicos, da flora e fauna através da observação do ambiente para preverem fenômenos climáticos (BAUER; DE JONG; INGRAM, 2022). Entre agricultores na Etiópia, a percepção das MC dependeria principalmente do conhecimento tradicional (DAWIT; DINKA; HALEFOM, 2022). KOM et al., 2022 encontraram diferentes níveis de conhecimento das MC entre indígenas na África do Sul. O estudo mostrou que os indígenas têm utilizado indicadores baseados na flora e fauna para realizar previsões meteorológicas e para tomar decisões sobre quando e o quê plantar. Agricultores em Gana utilizam o conhecimento tradicional meteorológico por meio de indicadores da flora e fauna para preverem a época da chuva e a presença de raios (BAFFOUR-ATA *et al.*, 2021).

Porcentagem ainda menor (2%, n=8) dos artigos contém descrições da percepção sobre o clima ou variabilidade climática usando informações provenientes de pessoas de fora da comunidade e/ou da mídia, como rádio, televisão, jornais, revistas. Dentre os oito artigos, foi encontrado que agropastoralistas em Burkina Faso utilizaram o rádio, discussões informais e pessoas de fora da comunidade para se informarem sobre as MC (SORGHO et al., 2020). Estudo com agricultores na África do Sul retratou que participar de uma associação de agricultores, assim como ouvir o rádio aumentaram a percepção sobre as MC (OJO; BAIYEGUNHI, 2021). Já indígenas do Níger recebiam informações das MC da rádio local, televisão, associação de agricultores e do celular (ADO *et al.*, 2019), enquanto aqueles de Bangladesh recebiam informações provenientes da televisão, de jornais, organizações não-governamentais e de pesquisadores (AHMED; ATIQUL HAQ, 2019).

Mesma porcentagem de artigos (2%) descreveu a percepção como o grau de preocupação de indivíduos sobre os efeitos das MC nas atividades de subsistência. Por exemplo, no estudo de BUDHATHOKI et al., 2020a, os agricultores no Nepal estavam mais preocupados com as inundações e menos com ondas de calor e períodos de frio na agricultura, embora relatassem que todos esses eventos, junto das secas, representavam os principais riscos climáticos. LONE et al., 2022 informaram como havia diferentes níveis de preocupação dos agricultores na Índia com os efeitos das MC na agricultura. Já EITZINGER; BINDER; MEYER, 2018 mostraram que os agropastoralistas mais velhos na Colômbia estão mais preocupados com as MC do que indivíduos mais jovens. MAKUVARO et al., 2018 mostraram que agropastoralistas do Zimbábue estavam preocupados com os efeitos das MC na agricultura e pecuária.

Somente um artigo apresentou a percepção medindo-a através do conhecimento científico dos indivíduos sobre as MC (DAS; ANSARI; GHOSH, 2022). Por fim, 4% dos artigos (n=14) não apresentaram qualquer descrição em resultados sobre o que seria a percepção das MC pelos entrevistados (e.g., ALAM; ELAHEE HRIDOY; NAIM, 2021; AMBROSIO-ALBALA; MAR DELGADO-SERRANO, 2018; BUDHATHOKI et al., 2020b; ISLAM et al., 2021; JELLASON et al., 2019; KHANAL et al., 2018; LEMAHIEU et al., 2018; MAKONDO; THOMAS, 2018; NG'OMBE; TEMBO; MASASI, 2020; QUANDT, 2019; SALITE, 2019; SARKER et al., 2020; TORRES et al., 2022). Embora estes artigos tenham proposto avaliar a percepção das MC, estes artigos vão por caminhos diversos. Por exemplo, SALITE, 2019 se concentrou nas crenças sobre a seca e as razões por trás das crenças. QUANDT, 2019 tratou sobre a percepção da resiliência nos

modos de vida e a correlação da percepção da seca com outras variáveis como, por exemplo, grupo étnico. MAKONDO; THOMAS, 2018 focou em mudanças em hábitos alimentares, na migração, em tabus, espiritualidade e serviços ecossistêmicos para examinar o conhecimento tradicional e a conscientização sobre as MC e os riscos ambientais relacionados. LEMAHIEU et al., 2018 retrataram mudanças no ambiente. AMBROSIO-ALBALA; MAR DELGADO-SERRANO, 2018 usou a metodologia Q para explorar e comparar as diferentes visões de mundo segundo a teoria cultural. Por fim, KHANAL et al., 2018 analisaram os determinantes e os impactos nas estratégias de adaptação.

A descrição completa de todos os trechos extraídos dos resultados dos 361 artigos conforme descrito pelos autores (quando explícito) consta no Apêndice I.

5.7. Fenômenos observados

A percepção através da observação de um fenômeno físico foi relatada em 96% dos artigos (n=346). Nesses artigos foi fornecida uma descrição das mudanças observadas ou não pelos indivíduos da temperatura, precipitação, vento, surgimento de eventos climáticos extremos ou anomalias (por exemplo, seca, furacão, incêndio, deslizamento de terra, inundação, tornado, entre outros), ou mudanças nas estações. A segunda percepção mais retratada nos artigos foi a observação de fenômenos humanos. Deste modo, em 85% dos artigos (n=309) foram observadas mudanças nas práticas de subsistência (como mudança no período de realização da atividade ou sua não realização); mudanças na saúde humana (e.g., surgimento de doenças, necessidade de saneamento básico); mudanças na disponibilidade de alimentos, migração humana ou perda/ganho de conhecimento tradicional. Por fim, a percepção de fenômenos biológicos foi relatada em 70% dos artigos (n=254). Logo, os artigos apresentaram observações de mudanças ou não em plantas (e.g., o florescimento de uma determinada planta, cobertura vegetal e espécies invasoras), animais (e.g., o aparecimento de um animal específico, desaparecimento de insetos, surgimento de pragas, espécies invasoras) e outros seres vivos.

5.8. Limitações do mapeamento

A presente revisão tem algumas limitações potenciais devidas aos procedimentos de busca adotados que, contudo, não parecem ser importantes para alterar os resultados aqui apresentados.

A primeira limitação decorre do fato que os documentos revisados estavam todos em inglês devido tanto à familiarização com o idioma pela equipe de revisão, quanto ao fato de ser o idioma científico universal. Assim, não foram considerados artigos em outros idiomas que não o inglês por três motivos. Primeiro, o objetivo deste artigo era identificar e descrever os vários conceitos de percepção em uso e não computar todos os artigos que usaram o termo, tarefa que seria impossível dado o número de artigos publicados na área. Em segundo lugar, os pré-testes não indicaram distribuição geográfica no uso do conceito; ou seja, não pareceu existir diferenças conceituais por países ou regiões que justificassem a necessidade de inclusão de mais idiomas. Terceiro, não há tradução direta de alguns termos de percepção (e.g., *attitudes*, *awareness*) entre alguns idiomas e, portanto, incluir outros idiomas adicionaria inconsistências no processo de codificação. Apesar de limitar as evidências disponíveis, esta escolha garantiu o acesso a pesquisas mundiais, mesmo de países com menos acesso a publicações, como os resultados mostram, por exemplo, para a quantidade de artigos publicados que se referem ao continente africano. Além disso, este artigo visou sistematizar e analisar o uso alternativo do termo percepção em MC. Diferenças de linguagem entre idiomas provavelmente representariam desafios intransponíveis para nossa revisão, especialmente considerando que boa parte das definições eram implícitas.

Uma segunda limitação do estudo é que a busca restrita ao período de 2018 a 2022, o que pode ter levado à negligência de algumas populações de pequena escala (como consta no Apêndice E). Neste caso, contudo, seria mais relevante se houvesse mudanças temporais nos usos do conceito de percepção, por exemplo. De qualquer forma, a adoção do período mais recente significa que o contexto atual é aquele retratado na pesquisa.

Por fim, a terceira a limitação potencial seria se os termos (*string*) de pesquisa (ver Apêndices D e E) tivesse deixado de lado alguns artigos pertinentes à área. Como os termos foram extensivamente pré-testados, ainda que existam artigos negligenciados, é improvável que tenham características muito diferentes do que aqueles aqui apresentados. Assim, as conclusões devem ser mantidas.

Por fim, embora a lista de códigos e de constructos para percepção tenha sido seguida durante todo o processo de extração dos dados, é possível que conceitos implícitos possam ter sido negligenciados dada sua natureza subjetiva. Mesmo assim, a avaliação por dois revisores deve ter limitado este erro. Além disso, não se espera que haja algum viés que possa comprometer ou alterar os resultados da pesquisa.

6. CONCLUSÃO E IMPLICAÇÕES

Este mapeamento sistemático forneceu uma descrição detalhada sobre como é utilizado o conceito de percepção das MC na literatura científica mais recente. Após a triagem de 5.358 artigos, foram identificados 361 estudos relevantes para comporem a base de dados.

A partir da análise destes artigos, concluiu-se que o número de artigos que explicitaram o conceito de percepção foi baixa, representando apenas um sexto do total. Assim, a literatura é sobretudo composta por usos implícitos do conceito, analisados aqui por meio de constructos identificados nos artigos.

Nos artigos em que as definições de percepção das MC em populações de pequena escala foram apresentadas, essas variaram. Foi possível reunir tais definições explícitas em sete grupos principais, dentre os quais estão a percepção de risco, a percepção segundo constructos psicológicos e estímulos sensoriais, a consciência, a experiência prévia, a observação de variáveis climáticas, as crenças e interpretação do ambiente e, por fim, as incertezas e ameaças.

Quando avaliado o conjunto de definições, tanto explícitas como implícitas, os resultados indicaram que os conceitos adotados são interdisciplinares. Por exemplo, a percepção não correspondeu somente a constructos psicológicos e sensoriais, mas compreendeu também a experiência direta e indireta com o fenômeno, as crenças, visões de mundo e o conhecimento tradicional. A análise também mostrou que, por vezes, os textos são pouco claros e até mesmo incoerentes em termos conceituais. Frequentemente, ocorreu de os artigos científicos iniciarem definindo percepção como, por exemplo, estímulo sensorial para, posteriormente, nos resultados, os autores se referirem à percepção como sendo a preocupação do indivíduo sobre as MC, ou então como as crenças no fenômeno.

Apesar da pouca clareza conceitual, essa variabilidade encontrada é importante e deve ser mantida, considerando que não apenas a percepção e consciência são relevantes para entender como as pessoas interagem com as MC. Outros fatores são importantes, como percepção de risco, crenças que os indivíduos têm sobre as MC, assim como ter sido exposto direta ou indiretamente ao fenômeno, ou a seus efeitos.

Não apenas as definições de percepção foram diversas, mas também variaram muito as áreas temáticas e os constructos de percepção utilizados nos artigos. Foi comum que em um mesmo artigo fosse abordado mais de um assunto ou constructo de percepção, embora tenha sido

frequentemente difícil identificar qual era (ou eram) o(s) constructo(s) de percepção adotados, posto que muitas vezes o conceito estava somente implícito.

Ao menos na literatura mais recente, as populações de pequena escala não indígenas foram mais estudadas do que as populações de pequena escala indígenas. Já os continentes mais abordados foram o continente africano e asiático, possivelmente pelos maiores impactos esperados.

Quanto ao aprofundamento teórico, concluímos que ele não existe em muitos artigos. Mesmo que os artigos apontem uma teoria ao longo do texto, não são de fato guiados por essa teoria para avaliar os resultados e, frequentemente, a referência à teoria foi somente pontual. Por exemplo, a teoria aparece somente em métodos ou discussão final, sem que a coleta de dados tenha sido por ela direcionada. Como esperado, quando são adotados *frameworks* de análise, por exemplo, do *Sustainable Livelihoods (Capital Approach Framework)*, ou a partir de teorias da Psicologia Cognitiva, os resultados são mais facilmente comparáveis entre si e, portanto, permitem avanços científicos maiores.

Para concluir, pesquisadores que adotam o conceito de percepção das MC são de áreas muito diversas e é possível que, em muitos casos, não tenham formação acadêmica em disciplinas em que a percepção é tradicionalmente investigada, como a Psicologia, ou mesmo nas Ciências Sociais. Assim, não seguem os "protocolos" dessas ciências em que a clareza conceitual é necessária e, portanto, que os conceitos sejam apresentados de maneira direta, explícita e coerente nos trabalhos. Com isso, os avanços científicos sobre os determinantes ou as consequências da percepção das MC podem ser tanto menos visíveis, quanto mais lentos.

6.1. Implicação para política/gestão

Há ao menos quatro implicações dos resultados para a política e gestão das MC.

Primeiro, a literatura em MC é interdisciplinar, como ficou evidente nos resultados deste mapeamento. Portanto, como contribuição política científica, é imprescindível o diálogo entre diferentes disciplinas para que a definição do conceito de percepção possa ser entendida de maneira interdisciplinar. Essa visão mais abrangente garantiria que pesquisadores de diversas áreas pudessem continuar os seus estudos sobre percepção com populações de pequena escala, independentemente de possuírem entendimento sobre teorias da Psicologia Cognitiva.

Segundo, o aprofundamento do conceito de percepção nessa literatura é necessário, pois sua ausência pode levar a conclusões errôneas, estratégias de adaptação limitadas e à não percepção

do que são as MC de fato. Por exemplo, se na maior parte dos estudos a percepção é tratada como uma medida da observação direta de desastres naturais no momento atual sem considerar mudanças graduais de fenômenos e mudanças, as medidas de adaptação podem desconsiderar mudanças menos evidentes com efeitos de longo prazo mais severos como, por exemplo, alterações na produtividade da agricultura. Uma vez que, ao longo do tempo, as MC deverão gerar novos impactos, é importante que haja percepção sobre as MC, para que as estratégias de adaptação se adequem às novas condições climáticas de maneira eficaz.

Terceiro, a falta de clareza conceitual sobre a percepção pode dificultar a participação efetiva de comunidades de pequena escala tanto nas pesquisas, como na implementação de estratégias de adaptação. Isso porque as comunidades podem entender de maneira diversa dos pesquisadores o conceito e os seus constructos. Assim, formas alternativas de perceber alterações que são em si mais graduais, ou cuja percepção é mais subjetiva ao invés de objetiva podem ser negligenciadas, pois não foram consideradas quando se perguntou sobre percepção ou foram mal compreendidas pelo pesquisador. Além disso, a não definição do conceito dificulta que aquilo que as comunidades percebem como problemas alcancem de fato as agendas públicas de debate sobre os problemas associados às MC.

Por fim, a noção que os pesquisadores têm sobre percepção é adotada nos levantamentos (e.g., confecção de entrevistas de percepção aplicados com populações de pequena escala), as quais não necessariamente contribuem diretamente com informações para o delineamento de políticas. Visões equivocadas sobre as MC podem levar a políticas posteriores com resultados pouco eficazes, colocando em risco as populações que já são as mais vulneráveis.

6.2. Implicação para a pesquisa científica

Três implicações para pesquisa são apresentadas.

Primeiro, sugere-se a realização de mais estudos com populações de pequena escala na região da América Central e América Latina, uma vez que os resultados do mapa sistemático atual identificam claramente a necessidade de mais estudos nessas duas regiões. É importante que mais estudos sejam realizados nessas regiões por haverem populações de pequena escala com características diversas (e.g., indígenas e não indígenas, com diferentes níveis de dependência de recursos naturais, vivendo em diferentes ecossistemas, próximas e distantes de áreas urbanas) que serão afetadas pelas MC. Ademais, as descrições das áreas temáticas apresentada aqui fornecem

uma descrição da base de evidências que pode auxiliar pesquisadores a identificarem quais tópicos de pesquisa necessitam de mais estudos científicos sobre a percepção de MC em populações de pequena escala.

Segundo, definir o conceito de percepção é importante para viabilizar a comparação dos resultados entre diferentes estudos. A comparação desses resultados torna-se inviável quando: (i) o conceito de percepção não é definido ou (ii) são utilizadas diferentes definições para percepção em um mesmo artigo de maneira inconsistente e incoerente.

Terceiro, é provável que muitos aspectos da percepção possam estar sendo negligenciados, embora possa parecer que não devido ao uso de termos. Por exemplo, os autores podem estar se referindo à experiência direta nos resultados dos artigos, mesmo quando adotam outro termo como, por exemplo, observação das MC pela prática das atividades de subsistência.

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8. APÊNDICES[12]

Apêndice A – Protocolo publicado em *Environmental Evidence Journal.*

Apêndice B - Protocolo *Reporting standards for Systematic Evidence (ROSES).*

Apêndice C - *Codebook*

Apêndice D - Processo de elaboração da *string.*

Apêndice E - Lista teste com as 95 publicações de referência

Apêndice F - Lista completa de referências dos artigos selecionados para leitura na íntegra.

Apêndice G - Lista completa dos artigos excluídos na etapa de filtragem por título e resumo, juntamente com os motivos da exclusão.

Apêndice H – Lista das definições explícitas de percepção (na íntegra).

Apêndice I – Lista completa da descrição de como a percepção aparece nos resultados.

[12] Os apêndices constam ao final da tese.

CAPÍTULO II - PERCEPÇÃO DAS MUDANÇAS CLIMÁTICAS PELO POVO INDÍGENA KHÎSÊTJÊ DA AMAZÔNIA BRASILEIRA

RESUMO

A mudança no clima global já está ocorrendo e impactando os sistemas natural e humano ao redor de todo o mundo, afetando principalmente os povos indígenas pela alta dependência dos recursos naturais para subsistência, baixa capacidade de lidar com imprevistos climáticos e eventos extremos e infraestrutura deficitária em muitas localidades, que gera implicações na saúde desses povos pela emergência ou aumento de doenças infecciosas. Embora o cenário seja preocupante, os povos indígenas têm o potencial de agir como protagonistas nesse cenário, contribuindo à mitigação das mudanças climáticas com a observação direta no local onde vivem e com seus conhecimentos tradicionais. Essa percepção sobre o clima e as variabilidades climáticas é importante aos povos indígenas e ao conhecimento científico por contribuírem na interpretação das mudanças climáticas em curso, auxiliar na tomada de decisões e fornecer informações em locais cujos dados são inexistentes ou incompletos. Porém, o debate sobre a importância da percepção é pouco qualificado por duas razões. Primeiro, a literatura utiliza diferentes conceitos de percepção, sem explicitar quais são importantes, dificultando comparações entre os estudos. Segundo, nem sempre o que é percebido é o que ocorre de fato, além da percepção estar sujeita à imprevisibilidade e incerteza climática, diminuindo assim a confiança para seu uso futuro e no suporte para a tomada de decisão. Por essas razões, este capítulo tem dois objetivos. Primeiro, entender a percepção de indivíduos do povo indígena Khĩsêtjê, da Amazônia brasileira, sobre as mudanças climáticas locais, suas causas e consequências para os modos de vida. O segundo objetivo é entender até que ponto a "percepção" está alinhada ao conhecimento climático para a área amazônica e quais as suas limitações, especialmente em termos das possibilidades de adaptação às mudanças. O delineamento empregado foi observacional do tipo transversal, adotando uma abordagem quantitativa na coleta de dados por meio de *survey* por entrevistas estruturadas presenciais. As entrevistas estruturadas foram realizadas em agosto de 2019 com indivíduos da comunidade Khĩkatxi (n=109), seguindo uma amostragem não probabilística. Cinco resultados principais foram encontrados. Primeiro, há uma alta percepção sobre a ocorrência das mudanças climáticas entre os Khĩsêtjê. Eles percebem mudanças graduais na temperatura, precipitação, quantidade de raios e intensidade de ventos, mudanças na flora e fauna da região e têm percebido alguns eventos inusitados que aconteceram

na aldeia nas últimas décadas. Segundo, as causas humanas foram atribuídas como as responsáveis pela mudança climática. Terceiro, os Khĩsêtjê têm acesso a diferentes fontes de informação sobre as mudanças climáticas. Quarto, os Khĩsêtjê utilizam o conhecimento tradicional para fazer previsões de curto prazo (dias/semanas) para antever: (i) o período do ano como as épocas da seca e de chuva e (ii) especificamente o início das chuvas e do plantio de mandioca no roçado. Quinto, há uma preocupação em como se adaptar às mudanças climáticas. Embora os Khĩsêtjê já estejam implementando algumas estratégias de adaptação, 90% dos entrevistados não se sentem preparados para enfrentar as mudanças climáticas. Portanto, conclui-se que os Khĩsêtjê percebem as mudanças climáticas, embora sejam observadas mudanças no contexto local e não global.

Palavras-chave: Conhecimento tradicional. Indicador tradicional. Observação direta. Experiência. Atividades de subsistência. Percepção.

1. INTRODUÇÃO

As mudanças climáticas (MC) já estão ocorrendo e impactando os sistemas natural e humano ao redor do mundo (IPCC, 2018). Desde o período pré-industrial (~1850/1900), atividades humanas provocaram o aumento de 1ºC na temperatura média da superfície terrestre (IPCC, 2018) e o Painel Intergovernamental sobre Mudanças Climáticas (*Intergovernmental Panel on Climate Change* - IPCC) estima, com alta confiança, que o aquecimento esteja aumentando 0,2ºC na média por década (IPCC, 2018). A causa central desse aquecimento global é o aumento, desde 1750, nas concentrações de gases de efeito estufa (GEE), como é o caso do dióxido de carbono (CO_2) que cresceu 47%, cifra que supera os valores usuais nos últimos dois milhões de anos. Já a concentração de gás metano (CH_4) aumentou 156%, enquanto aquela de óxido nitroso (N_2O) subiu 23%, ambos valores superiores aos observados nos últimos 800 mil anos (IPCC, 2021a). Caso nenhuma medida seja tomada para reduzir as emissões de GEE, prevê-se que a temperatura exceda 2ºC durante o século XXI (IPCC, 2021a).

As MC devem afetar a vida de milhões de pessoas no mundo. Porém, sobretudo as populações de pequena escala tradicionais devem ser mais impactadas negativamente (COHN *et al.*, 2017; IPCC, 2018; SAVO *et al.*, 2016). Inclusive, é o caso das populações de pequena escala na Amazônia, como muitos dos povos indígenas que habitam 424 terras indígenas na Amazônia Legal, equivalente a 23% do território (ISA, 2021). Ao menos três razões explicariam porque os povos indígenas são vulneráveis aos efeitos adversos das MC.

Primeiro, povos indígenas são sociedades muito afetadas porque enfrentam, frequentemente, altas taxas de pobreza e privação quando comparados às populações não indígenas (HALL; PATRINOS, 2006). Ademais, a pobreza aumenta a probabilidade destes indivíduos serem afetados negativamente por choques e estresses climáticos, como seca extrema, ondas de calor, ou inundações (LEICHENKO; SILVA, 2014). Sendo assim, povos indígenas têm baixa capacidade para lidarem com imprevistos climáticos e eventos extremos (KRONIK; VERNER, 2010; VERNER, 2010).

Segundo, essas sociedades usualmente dependem diretamente dos recursos naturais para a própria subsistência (AHMED; ATIQUL HAQ, 2019; MACCHI et al., 2008). Na América Latina, por exemplo, grande parte dos povos indígenas vive através da pesca, caça, coleta e pratica a horticultura ou a agricultura intensiva tradicional (e.g., milho na Mesoámérica e batata nos Andes) (KRONIK; VERNER, 2010). Tais atividades de subsistência são sensíveis ao clima

(LEICHENKO; SILVA, 2014) e, por conta disso, podem sofrer variações na qualidade e quantidade de seus produtos, comprometendo assim a segurança alimentar das populações indígenas (PATTERSON et al., 2016). Há também atividades que são sazonais, como é frequentemente o caso da coleta de produtos florestais não madeireiros, da caça e da pesca, os quais estão mais susceptíveis a qualquer variabilidade climática (GERRARD, 2008), especialmente quando são praticadas em locais ambientalmente frágeis (KRONIK; VERNER, 2010).

Por fim, em terceiro, as MC afetam muito as populações indígenas, pois, além da pobreza individual, muitas dessas populações vivem em localidades com infraestrutura deficitária, o que pode ter implicações não somente para a subsistência, mas também para a saúde. As condições precárias de saneamento e acesso à água em muitas terras indígenas, juntamente com a pobreza (BRIERLEY et al., 2014), fazem com que suas populações que vivem em regiões tropicais tenham que lidar cotidianamente com diversas doenças infecciosas, como diarreia, cólera, leptospirose, malária, dengue e febre amarela (BRIERLEY et al., 2014; HOFMEIJER et al., 2013). As MC podem, portanto, agravar esse cenário (BARTLOW et al., 2019; ELLWANGER et al., 2020), já que existe relação causal entre variabilidade climática, pressões sobre as terras indígenas, como por exemplo, o desmatamento provocado pela agricultura industrial e mineração (ELLWANGER et al., 2020), com o aumento e⁄ou a emergência de doenças infecciosas (FLAHAULT; DE CASTANEDA; BOLON, 2016; GITHEKO et al., 2000). Por exemplo, todo ano, aproximadamente 1,1 a 1,27 milhões de pessoas (indígenas e não indígenas) morrem de malária no mundo (WORLD HEALTH ORGANIZATION, 2014). Assim, se houver um aquecimento de 2ºC ou 3ºC na temperatura média global, estima-se o risco de a população mundial ser infectada por malária possa aumentar em até 5%, principalmente em locais onde inexistem programas de controle dessa doença (HALLEGATTE et al., 2016).

Condizente com o grau de ameaça que sofrem, as populações de pequena escala, em diversos locais do mundo, já estão percebendo as MC. Essa percepção sobre o clima e as variabilidades climáticas é de extrema importância aos povos indígenas e outras partes interessadas. Nos povos indígenas, tal percepção é mediada pelo conhecimento tradicional local, o qual é gerado em um processo dinâmico de observação, por vezes repetidas, de algum fenômeno. Com isso, o conhecimento pode permitir a certos indivíduos o reconhecimento de indicadores físicos (e.g., constelações, formato das nuvens, ciclo lunar, aumento da seca, diminuição da precipitação) e⁄ou biológicos associados às mudanças (e.g., comportamento dos animais,

florescimento de plantas) (INMAN; HOBBS; TSVUURA, 2020). Por exemplo, para o povo indígena Himba habitante da Namíbia, indicadores biológicos como o movimento de aves e a presença de determinados insetos indicam quando haverá seca (INMAN; HOBBS; TSVUURA, 2020). A partir daí, o conhecimento é transmitido entre indivíduos de uma mesma ou através de diferentes gerações, sendo que a sua aquisição é influenciada por experiências prévias, crenças, hábitos, visões de mundo e normas sociais (BERKES; BERKES, 2009). Este conhecimento é também a base para a tomada de decisões quanto ao uso e à gestão dos recursos naturais (BAUER; DE JONG; INGRAM, 2022; PYHÄLÄ *et al.*, 2016). Por exemplo, os povos indígenas no Peru e na Bolívia utilizam um indicador físico, a constelação das Plêiades, para preverem a quantidade de precipitação esperada na estação chuvosa e, portanto, quando devem plantar (ORLOVE; CHIANG; CANE, 2002). Portanto, a percepção sobre as variabilidades climáticas e seus efeitos sobre as atividades locais pode existir ou não devido ao conhecimento tradicional transmitido entre indivíduos. Com isso, o conhecimento pode auxiliar as pessoas a interpretarem o que ocorrerá no futuro próximo de poucas horas, ou em períodos mais longos, como meses.

Por conta dessa visão, a literatura científica afirma reiteradamente que a "percepção" sobre as MC é vital para a sobrevivência das populações de pequena escala, dado que estas dependem diretamente das condições climáticas para realização de suas atividades de subsistência (BALEHEGN *et al.*, 2019) e para o uso dos recursos naturais. Especialmente para a agricultura, a capacidade de perceber as condições climáticas e até mesmo prever o clima é importante, pois a atividade exige planejamento do local (e.g., próximo/distante do rio e da casa) e de quando cada fase será executada (e.g., preparação do terreno, queima, plantio, colheita de produtos) (MUGI-NGENGA *et al.*, 2021), como estudos com povos indígenas da Amazônia peruana mostram (LASTRA LANDA; GRADOS BUENO, 2022). Portanto, para que os povos indígenas tenham condições e capacidade de lidar com as MC e suas consequências, é vital que eles percebam as mudanças esperadas e em curso com as suas terras e os seus recursos, assim como consigam prever o que poderá ocorrer em um futuro próximo ou mais distante. Ou seja, a percepção é o primeiro passo para que estas populações possam delinear e implementar estratégias de adaptação, quando necessário (DERESSA; HASSAN; RINGLER, 2011).

Ao perceberem as MC, as populações podem potencialmente agir como protagonistas desse cenário de ao menos duas maneiras. Primeiro, podem continuar contribuindo à mitigação das mudanças, com a preservação de seus territórios, uma vez que ~36% das áreas de floresta bem

conservadas do mundo estão dentro de Terras Indígenas (FA *et al.*, 2020). Segundo, podem auxiliar seus próprios povos com a observação direta no local onde vivem e com os seus conhecimentos tradicionais acumulados ao longo de gerações sobre as MC e seus indicadores físicos e biológicos (KOM *et al.*, 2022; SBPC, 2021). Por fim, a percepção das comunidades locais pode auxiliar na complementação de dados científicos em regiões onde estes são escassos pela: (i) inexistência de equipamentos necessários para medição das variáveis climáticas no local ou (ii) sua insuficiência em coletar constantemente as informações por motivos técnicos ou operacionais (REYES-GARCÍA *et al.*, 2016; SAVO *et al.*, 2016).

Apesar de reiteradas manifestações a respeito da importância da percepção das MCs, o debate científico sobre o tema é pouco qualificado por ao menos duas razões distintas.

Primeiro, porque o conceito de percepção na literatura é utilizado adotando diferentes constructos e com diferentes significados, o que impede entender quais aspectos são efetivamente importantes. Isso ocorre devido à falta de padronização no uso e no significado dos termos, que torna a comparação entre resultados de investigações inviável (TRONCARELLI; MORSELLO, 2022). Por exemplo, o conceito de percepção pode ser definido explicitamente como a experiência prévia com as MC (BAUER; DE JONG; INGRAM, 2022; SEREENONCHAI; ARUNRAT, 2019), mas também como percepção de risco (ALMUDI; SINCLAIR, 2022; TIET; TO-THE; NGUYEN-ANH, 2022) ou percepção no sentido de estímulos do ambiente e/ou sensoriais (BELAY *et al.*, 2022; MAIRURA *et al.*, 2021; TORRES *et al.*, 2022). Além disso, muitas vezes o sentido não é explicitado nos estudos, mas implicitamente se refere a constructos diversos como, por exemplo, crença (SRAKU-LARTEY *et al.*, 2020), consciência (AKANO *et al.*, 2022), exposição indireta às informações sobre as MC via mídia ou outras pessoas (SHUKLA *et al.*, 2019), conhecimento tradicional (KOM *et al.*, 2022) ou preocupação com as MC (LONE *et al.*, 2022).

Segundo, embora o que as populações de pequena escala percebem sobre as MC, as auxiliem a tomar decisões necessárias, tanto no planejamento das atividades de subsistência (ALEMAYEHU; HIZKEAL, 2022; KOM *et al.*, 2022; MUGI-NGENGA *et al.*, 2021), quanto no desenvolvimento de estratégias de adaptação às MC (ANKRAH; KWAPONG; BOATENG, 2022), podem haver discordância ou vieses entre o que é percebido pelas pessoas e o que está de fato ocorrendo. Esta diferença entre as condições reais e a percepção das pessoas dessa realidade reduz a habilidade das populações tradicionais de lidarem com os efeitos adversos das MC, ou de orientarem suas decisões de forma adequada para se adaptarem aos seus efeitos negativos (SON;

CHI; KINGSBURY, 2019). Além disso, mesmo que em alguns locais a percepção das populações concorde com a realidade (ANKRAH; KWAPONG; BOATENG, 2022), há incertezas inerentes às MC devido à imprevisibilidade natural dos fenômenos climáticos, inclusive dos eventos extremos que são deletérios (KAGUNYU; WANDIBBA; WANJOHI, 2016; SON; CHI; KINGSBURY, 2019). Por conta disso, as MC têm provocado redução na confiança de populações de pequena escala em interpretarem e utilizarem preditores climáticos tradicionais na tomada de decisão, sejam estes físicos (e.g., condições de umidade) ou biológicos (e.g., florescimento de plantas) (ALEMAYEHU; HIZKEAL, 2022; HOSEN; NAKAMURA; HAMZAH, 2020).

Sendo assim, este capítulo tem dois objetivos principais. O primeiro é entender quais são as "percepções[13]" sobre o clima em uma população indígena, em particular: (i) quais indicadores as pessoas usualmente observam para prever o clima e planejar as atividades de subsistência, como a agricultura, e se existe conhecimento comum a esse respeito; (ii) qual a percepção sobre as MC[14] e (iii) quais as causas das MC. O segundo objetivo é entender até que ponto essas fontes de "percepção" locais estão alinhadas com o conhecimento climático científico para a área amazônica e quais as limitações dessas percepções, especialmente em termos de direcionar as possibilidades de adaptação às MC.

Para isso, o estudo focará na análise de uma sociedade de pequena escala indígena da Amazônia – o povo indígena Khĩsêtjê, procurando entender quais desses aspectos são equivalentes em outras sociedades do tipo na Amazônia e, quando pertinente, em outras sociedades de pequena escala de outras regiões do mundo.

Estudar a percepção em uma população indígena na Amazônia brasileira é importante, pois além de colaborar com informações em temática que há poucos estudos, contribui no entendimento de como as MC são compreendidas e quais constructos são utilizados para conceituar essa forma de "percepção". Em termos práticos, o estudo pode auxiliar a entender os efeitos negativos e positivos das MC sobre as atividades de subsistência e os modos de vida de povos indígenas

[13] Neste documento, percepção é definida como um conjunto de constructos, podendo incluir um ou mais constructos: (i) a própria percepção através da experiência sensorial (observação/visão, tato, audição e olfato) e do contato com estímulos recebidos do ambiente, (ii) consciência (*awareness*), (iii) crenças, (iv) conhecimento tradicional, (v) experiência direta (vivenciar, observar ou ter contato direto com os efeitos das MC), (vi) experiência indireta (vivenciar as MC através do relato de outros indivíduos ou do acesso à diferentes fontes de informação), (vii) preocupação, (viii) percepção de risco, (ix) visão de mundo, (x) *atitude*, (xi) conhecimento científico.

[14] Neste documento, MC correspondem a alterações em variáveis climáticas medidas por longos períodos de tempo, superiores a aproximadamente duas décadas.

amazônicos (PYHÄLÄ *et al.*, 2016). As informações podem também auxiliar as populações locais a refletirem como poderiam estar melhor preparados para enfrentarem as mudanças.

O restante deste capítulo está organizado da seguinte forma. Primeiramente, são apresentados os métodos e as fontes de informações secundárias utilizadas. Em seguida, descrevem-se quais são as principais MC esperadas para a Amazônia como um todo e, logo a seguir, as mudanças previstas para a área de estudo do povo indígena Khĩsêtjê, a partir de dados secundários. A terceira parte aborda as caraterísticas sociodemográficas dos entrevistados e os resultados sobre os indicadores tradicionais observados pelos Khĩsêtjê. Posteriormente, reflete-se sobre a percepção dos Khĩsêtjê das MC e se essa percepção está alinhada às MC esperadas e observadas na Amazônia. Terminando o capítulo, são apresentadas as estratégias de adaptação que têm sido adotadas por eles.

2. MÉTODOS

2.1. Área de estudo

O povo indígena Khĩsêtjê habita a Terra Indígena (T.I.) Wawi (Mapa II.1) que, com 150 mil hectares, foi homologada em 1998 e está localizada no sudoeste da Amazônia Legal, Estado de Mato Grosso, Brasil (ISA, 2022).

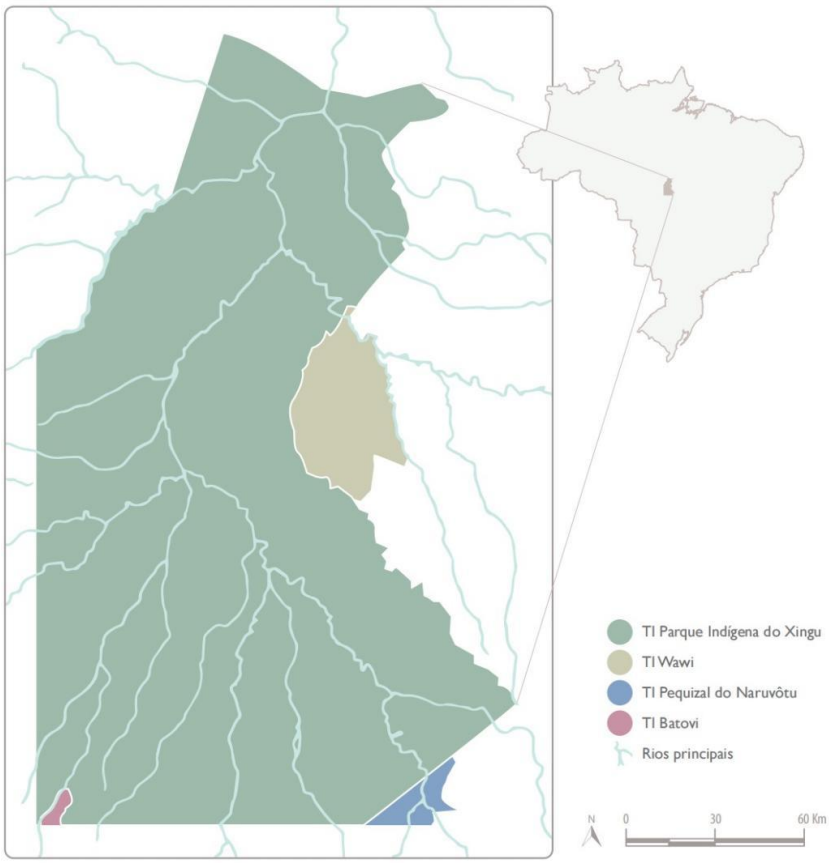
Os Khĩsêtjê fazem parte do tronco linguístico Jê, da família linguística Macro-Jê (ISA, 2019). Em 2020, a população era de 589[15] pessoas (MENDONÇA, 2021) e, até 2019, ano da coleta de dados, havia cinco aldeias dentro da T.I.: Khĩkatxi, Jarumã, Horehusĩkrô, Ngôsôkô, Ngôjhwêrê. Entre 2019-2021, outras aldeias foram criadas, totalizando nove aldeias: Khĩkatxi, Jarumã, Horehusĩkrô, Ngôsôkô, Ngôjhwêrê, Riktxikhô, Ngôtxire, Wakatxi e Thyrykhô (MENDONÇA, 2021). Formada em 2016 a partir de todos os habitantes de Ngôjhwêrê, outra aldeia Khĩsêtjê, denominada de Khĩkatxi é a aldeia mais populosa dentre essas. Naquela ocasião, todos os habitantes migraram[16] de Ngôjhwêrê, situada próxima aos limites da T.I. Wawi, em direção a esta nova área, aproximadamente 20 quilômetros para dentro da T.I. Os Khĩsêtjê realizam expedições com muita frequência aos seus vizinhos (fazendas, locais de antigas aldeias ao longo do rio Suiá-Miçu e às próprias cidades próximas da T.I.), mantendo uma estratégia de diálogo permanente e de

[15] O número equivale a população total, considerando outros povos que moram junto aos Khĩsêtjê.

[16] A migração pode ser temporária ou até mesmo demorar muitos anos. As antigas aldeias se tornam reservas de recursos materiais. Inclusive, uma das aldeias atuais (Thyrykhô) era uma antiga aldeia utilizada pelos Khĩsêtjê antes do contato com os irmãos Villas-Bôas.

relações sociais e políticas, como forma de monitoramento e controle das atividades de não-indígenas sobre o seu território. Além disso, nessas expedições em antigas aldeias, é realizada a coleta de recursos naturais como frutas, sementes e tubérculos (SANCHES; FUTEMMA; ALVES, 2021). Portanto, a localização de aldeias próximas aos limites da T.I. é uma das estratégias para monitoramento e controle de seu território.

Mapa II.1 – Terra Indígena Wawi (Localização aproximada: -11.749043, -53.047220).



Fonte: TRONCARELLI, 2022.

As aldeias Khĩsêtjê são circulares, com cozinhas atrás das casas. Em Khĩkatxi, há uma Casa das Mulheres e uma Casa dos Homens (Figura II.1, letra D), onde acontecem conversas informais e reuniões entre os membros da comunidade, confecção de artesanato e apresentações culturais. Nesta mesma aldeia, há um posto da Fundação Nacional dos Povos Indígenas (FUNAI), a sede da Associação Indígena Khĩsêtjê (AIK), uma escola e uma Unidade Básica de Saúde Indígena (UBSI) (Figura II.1, letra A). Até o momento, Khĩkatxi é a única aldeia com acesso à internet por meio de acesso através da escola e da UBSI. As aulas na escola são ministradas por professores indígenas

na língua Khĩsêtjê com uma proposta curricular específica e diferenciada criada em conjunto com a comunidade.

Figura II.1 – Aldeia Khĩkatxi. A letra A corresponde ao local onde se localiza a UBSI e a escola, a letra B à aldeia Khĩkatxi, a letra C à direção de onde está o rio Pacas e a letra D à Casa das Mulheres (lado direito) e dos Homens (lado esquerdo)

Fonte: Kamikiá Kisêdjê (2022).

O canto é uma característica marcante entre os Khĩsêtjê, com uma estrutura de comunicação e oratória complexa, sendo que aspectos centrais de sua vida social se constroem a partir de cerimônias e apresentações musicais (para mais informações, ver SEEGER, 2015).

As atividades de subsistência que os Khĩsêtjê dependem são divididas por gênero e consistem na pesca, caça, coleta de produtos da floresta e agricultura para subsistência (Figura II.2). Os homens caçam, pescam e coletam produtos da floresta para alimentação, como mel e frutas da floresta, materiais para confecção de artesanato e construção de casas, como madeira, cipós, palha de buriti (*Mauritia flexuosa* L.) e inajá (*Maximiliana maripa* (Aubl.) Drude). Quanto ao roçado, homens são responsáveis pela preparação do terreno, por derrubar árvores grandes e menores, preparar aceiros que evitem incêndios, queimar e plantar, além da limpeza periódica ao longo do ano. Mulheres também trabalham no roçado, em seu plantio, limpeza ao longo do ano e

na colheita de produtos. São também responsáveis pela coleta de produtos da floresta, neste caso de sementes, frutas, plantas medicinais e lenha para cozinhar. Embora pouco comum, algumas mulheres também pescam por gostarem da atividade. As crianças acompanham seus pais nas atividades no roçado e coleta de produtos da floresta, com exceção da caça. Neste último caso, somente adolescentes homens iniciam sua participação[17] sob a supervisão de homens mais velhos. Os Khĩsêtjê utilizam canoa e/ou barco de alumínio com motor para se deslocarem no rio.

A sazonalidade determina a substituição em termos de importância da dependência das atividades de caça e pesca como fontes de proteína. No período das chuvas, os Khĩsêtjê caçam mais do que pescam, enquanto no período da seca ocorre o inverso. As atividades de coleta são sazonais, a depender da oferta de produtos da floresta (e.g., frutos, sementes). Já as atividades no roçado ocorrem durante todo o ano, embora alguns produtos sejam colhidos em determinado períodos específicos, como é o caso do milho (*Zea mays;* ver calendário sazonal no Apêndice A[18]).

Figura II.2 – Atividade agrícola realizada entre os Khĩsêtjê

(2a) Roçado queimado na aldeia Khĩkatxi.

(2b) Mulher colhendo produtos do roçado.

[17] Há uma nomenclatura para cada fase de idade do sexo masculino e feminino, desde que nascem e que não necessariamente corresponde a uma idade fixa. O período que marca a adolescência masculina é chamado de Kwê ngáty (~entre 13 a 17 anos) ou de Sikwãndydjê (18 a 20 anos, quando o jovem se prepara para o casamento), enquanto a adolescência feminina é chamada de Sũmhrâ e se inicia após a primeira menstruação.

[18] O calendário sazonal não é inédito. Ele foi desenvolvido durante o mestrado em 2016 (TRONCARELLI, 2018) e atualizado em 2019.

(2c) Mandioca colhida no roçado.

(2d) Plantações de banana (ao fundo) e batata doce (embaixo e ao centro) em roçado.

Fonte: Lia Taruiap Troncarelli, 2019.

A T.I. faz parte do bioma Amazônia, com grande parte da cobertura vegetal em fitofisionomias de florestas ombrófilas e florestas estacionais perenifólias (IVANAUSKAS; MONTEIRO; RODRIGUES, 2008), bem como uma pequena parte de formações pioneiras[19] (ISA, 2022). Segundo a classificação de Köppen (1948), o clima enquadra-se em Tropical Chuvoso de Savana (Aw), cuja temperatura média anual se mantém sempre maior que 18°C, com duas estações bem definidas, ou seja, estação seca (precipitação inferior a 100 milímetros (mm)) e estação chuvosa (precipitação superior a 1.200 mm) (IVANAUSKAS; MONTEIRO; RODRIGUES, 2008).

Dois rios principais atravessam a T.I.: os rios Suiá Miçú e Pacas (Figura II.3). Na fronteira a oeste e ao sul da T.I., encontra-se a Terra Indígena Parque do Xingu (T.I.X.), criada em 1961[20], assim como as T.I.s Batovi e Pequizal do Narovutu, habitadas por 16 povos indígenas. Já na fronteira leste, há grandes empresas rurais de plantações de soja e milho, que acentuam a pressão e o desmatamento sobre as T.Is da região, além de assentamentos de reforma agrária. Mesmo com a T.I. Wawi demarcada, em 2021, houve denúncias de desmatamento ilegal e invasão na T.I. para

[19] O relevo plano da região favoreceu a monocultura na região por grandes empresas rurais.
[20] O Território Indígena do Xingu contempla quatro terras indígenas contíguas: T.I. Wawi e T.I. Batovi homologadas em 1998; T.I. Parque Indígena do Xingu homologada em 1961 e T.I. Pequizal do Narovutu homologada em 2016.

abertura de estradas e loteamento por parte de fazendeiros de soja (IONOVA, 2021; SOUZA, 2021). Estima-se que cinco milhões de hectares de florestas tenham sido transformados em terras agrícolas voltadas ao agronegócio nos últimos 50 anos devido à políticas públicas e privatização de terras em prol do desenvolvimento econômico na região (SANCHES; FUTEMMA; ALVES, 2021). Essas mudanças no uso do solo afetaram as temperaturas locais e, por sua vez, o regime de chuvas na região (MAEDA *et al.*, 2021).

Figura II.3 – Rios na T.I. Wawi.

(3a) Rio Suiá Miçú.

(3b) Rio Pacas.

Fonte: Lia Taruiap Troncarelli.

O histórico de ocupação da região do entorno das terras dos Khĩsêtjê começa em 1950, quando o governo estadual vendeu lotes de terras na região. Na década de 70, durante a ditadura militar, foram implementados projetos agrícolas de colonização com imigrantes vindos principalmente das regiões Sul e Sudeste do país. A ocupação se acentuou com a construção, em 1960, da rodovia BR-364 que liga a cidade de Brasília ao estado do Mato Grosso (CARVALHO *et al.*, 2002). A partir daí, incentivos fiscais foram concedidos a pequenos e grandes agricultores que ocuparam a região (SOLER; VERBURG; ALVES, 2014). A T.I. Wawi ainda não era homologada na ocasião e, assim como todo o entorno do T.I.X, passou a sofrer ao longo dos anos a transição de suas florestas para extração de madeira, pecuária e para a agricultura intensiva, principalmente a partir de 1990 (SANCHES; FUTEMMA; ALVES, 2021). Um dos municípios que tiveram expansão rápida das plantações de soja pelo agronegócio foi Querência (MACEDO *et al.*, 2013),

cuja cidade dista cerca de cinco a oito horas por automóvel da T.I. Wawi, a depender das condições da estrada de terra.

A T.I. Wawi, por estar cercada de grandes empresas rurais de soja e milho, está sujeita aos efeitos de incêndios florestais e desmatamento em seu entorno (Figura II.4). O cenário é preocupante, visto que, de 1985 para 2020, o estado de Mato Grosso perdeu 24% da vegetação nativa (MAPBIOMAS, 2020). Entre 2000 e 2017, 375.807 focos de incêndios foram identificados nas T.Is de Mato Grosso, no caso do T.I.X. e da T.I. Wawi, ambas tiveram um aumento significativo nos incêndios florestais (LIMA *et al.*, 2020). Entre 2001 e 2020, aproximadamente 7% do T.I.X (189 mil hectares) foram degradados por secas e incêndios (SILVÉRIO *et al.*, 2022). No estado de Mato Grosso como um todo, somente entre 2019 e 2021, o desmatamento equivaleu a 16%, ocupando não apenas propriedades rurais, mas T.Is e Unidades de Conservação (ALENCARA *et al.*, 2022).

Figura II.4 – Queimada em localidade externa à T.I. Wawi em 2022

Fonte: Renan Khisetjê, 2022.

2.2. Delineamento e métodos de coleta de dados

Este capítulo empregou um delineamento observacional do tipo transversal (*cross-sectional*), portanto não houve intervenção do pesquisador e os dados foram coletados em um único

momento no tempo (NEWING *et al.*, 2011). Este delineamento é apropriado para inferir e comparar características de uma mesma população (e.g., entre idades, gêneros), assim como as relações existentes entre essas características; por exemplo, renda monetária entre homens e mulheres ou entre diferentes classes etárias (NEWING *et al.*, 2011). Em nosso caso, comparamos a percepção sobre as MC, por exemplo, entre homens e mulheres com diferentes classes etárias.

Para a coleta de dados, foi adotada uma abordagem quantitativa por meio de *survey* por entrevistas estruturadas presenciais realizadas no período diurno. O *survey* seguiu um protocolo estruturado, coletando informações das mesmas variáveis em uma mesma unidade amostral (DE VAUS, 2002). As entrevistas estruturadas consistiram em um conjunto idêntico pré-definido de perguntas apresentadas de forma igual a todos os entrevistados (NEWING *et al.*, 2011).

As entrevistas estruturadas foram realizadas em agosto de 2019 com indivíduos da comunidade Khĩkatxi (n=109, i.e. 47% dos habitantes da comunidade Khĩkatxi com idade ≥ 18 anos). A amostragem foi não probabilística por conveniência (NEWING *et al.*, 2011), ou seja, todos os indivíduos da comunidade Khĩkatxi (n=231) foram convidados a participar das entrevistas, desde que tivessem mais de 18 anos de idade[21], mas apenas uma parte foi efetivamente entrevistada. A idade de corte de 18 anos foi escolhida, pois é a idade de referência brasileira para a maioridade civil. Portanto, as informações vieram de todos os indivíduos adultos disponíveis que quiseram participar da entrevista, com idade de corte de 18 anos. A unidade amostral para coleta de dados foi o indivíduo.

As entrevistas foram aplicadas de forma presencial e igualmente com todos os entrevistados, durando aproximadamente 60 minutos. Um intérprete Khĩsêtjê, previamente treinado e escolhido pela própria comunidade, esteve presente em todas as entrevistas para auxiliar com a tradução do idioma Khĩsêtjê para o português. A plataforma *Open Data Kit (ODK) Briefcase* (https://docs.getodk.org/) foi utilizada como *software* para a coleta e o armazenamento de informações das entrevistas, que foram realizadas presencialmente no formato digital utilizando um tablet.

As entrevistas incluíram dois módulos. O primeiro serviu a coletar informações sobre as características dos indivíduos, como nome, idade, fluência em português, fontes de renda monetária recebidas no último ano e mês. O segundo módulo tratou de informações sobre a realização das atividades de subsistência (i.e. agricultura, caça, pesca e coleta), percepção sobre as MC (se

[21] Em 2019 na comunidade Khĩkatxi haviam 388 indivíduos, dentre os quais, 157 tinham idade inferior a 18 anos.

percebem ou não as MC, suas causas e a ocorrência de eventos climáticos extremos), previsão do tempo através do conhecimento tradicional, previsão do início das chuvas e do plantio de mandioca no roçado, e sobre as estratégias de adaptação (e.g., ideias para potencial adaptação). O protocolo das entrevistas pode ser acessado no Apêndice B.

A escolha de entrevistas presenciais mostrou ser um método mais adequado do que alternativas, como por exemplo, um questionário autoaplicado, pois permitiu entrevistar indivíduos analfabetos, esclarecer dúvidas, motivar os entrevistados que se apresentavam cansados e reduzir erros de interpretação (DE VAUS, 2002). Porém, o método tem limitações. A primeira delas foi o tempo dedicado à formulação e aplicação das entrevistas, o que resultou em alguns entrevistados cansados e impacientes. A segunda foi a necessidade de contar com um intérprete Khĩsêtjê, situação que pode ter enviesado de alguma forma desconhecida as respostas, pois tanto as pessoas entrevistadas, quanto o intérprete têm dificuldades com o domínio da língua portuguesa. Por fim, a pandemia de Covid-19 ocorreu durante o período de estudo, impossibilitando a ida para campo a partir de 2020 a 2022 para aplicação de novas entrevistas. As visitas em T.Is durante a pandemia ficaram suspensas devido à alta vulnerabilidade e suscetibilidade de povos indígenas a epidemias. Exceção foi estabelecida somente para serviços essenciais, como entrega de alimentos, medicamentos, combustível e atendimento à saúde.

2.3. Dados secundários de temperatura e precipitação

Além dos dados primários, dados secundários de temperatura e precipitação da T.I. Wawi foram obtidos pela consulta às informações disponíveis no Portal The Climate Source (www.thecarbonsource.org/climate_explorer/)[22]. Os dados futuros foram estimados pelo Portal The Climate Source a partir de modelagem estimada no estudo de Baccini et al. (2017) (BACCINI et al., 2017; THE CLIMATE SOURCE, 2022). Estes dados serviram para informar as condições de temperatura e precipitação na T.I. Wawi, além de possibilitar a comparação com os dados de percepção dos indivíduos Khĩsêtjê.

Na T.I. Wawi não há uma estação meteorológica de medição de precipitação e temperatura. Portanto, procuramos também acessar dados meteorológicos de ~2002 a 2022 de dois municípios próximos à T.I., Canarana e Querência, ambos no estado de Mato Grosso. Embora o Instituto Nacional de Meteorologia (INMET) do Ministério da Agricultura, Pecuária e Abastecimento

[22] Dados de precipitação devem ser analisados com cautela, pois o modelo contém limitações.

informe a existência de estação automática meteorológica em Querência (desde julho de 2007) e uma estação convencional em Canarana (desde agosto de 1987), os dados disponibilizados em formato digital em INMET (https://bdmep.inmet.gov.br/) não estavam completos para muitos dos meses, impossibilitando seu uso para comparação.

2.4. Análise de resultados

A análise de dados foi realizada através do Stata® versão 13, para estatística descritiva dos dados, e do Windows Excel® LTSC MSO (Versão 2301) de 2021 para a confecção das figuras.

2.5. Considerações éticas

O estudo foi autorizado, primeiro, pela Fundação Nacional dos Povos Indígenas (FUNAI) (Autorização nº 94/AAEP/PRES/2018, processo nº 08620.013206/2018-41) (Apêndice C). Segundo, pela Comissão Nacional de Ética em Pesquisa (CONEP*)* através da submissão ao Comitê de Ética em Pesquisa (CEP) da Escola de Artes, Ciências e Humanidades da Universidade de São Paulo (CAAE nº 97750818.9.0000.5390) (Apêndice D). A participação nas entrevistas foi voluntária e consentida previamente pela comunidade. A comunidade foi visitada antes do início da coleta de dados para avaliar sua aceitação e explicar os objetivos da pesquisa, métodos e esclarecer qualquer dúvida. Durante todo o trabalho de campo, os Khĩsêtjê foram lembrados que a participação era voluntária e que a identidade dos participantes não seria divulgada.

3. RESULTADOS E DISCUSSÃO

Os resultados são apresentados da seguinte maneira. Primeiro, são exibidas as mudanças esperadas para a Amazônia e para a T.I. Wawi. Segundo, as características sociodemográficas dos entrevistados. Terceiro, os resultados obtidos das entrevistas sobre percepção das MC, os indicadores tradicionais e as estratégias de adaptação.

3.1. Cenários climáticos atuais e previstos para a Amazônia

Há evidências na literatura científica da ocorrência atual de MC na Amazônia, assim como cenários climáticos previstos. Desde 1979, vem ocorrendo um prolongamento da estação seca, entre os meses de junho a novembro (COSTA *et al.*, 2022a), com aumento de 6,5± 2,5 dias por década (FU *et al.*, 2013). O padrão das temperaturas médias também está mudando, principalmente

durante a estação seca, (COSTA *et al.*, 2022a). Entre 1910 e1979, a temperatura média anual na Amazônia central era de 26,6ºC. Já no que era o pico da época de seca, de setembro a outubro, a média mensal era de 27,6ºC, enquanto nos meses mais chuvosos, entre fevereiro e abril, descia para ~26ºC (RIBEIRO; ADIS, 1984). No entanto, há consenso relativo de que esses valores aumentaram, com estimativas que variam entre 0,5ºC (JIMÉNEZ-MUÑOZ *et al.*, 2016; JUNK; SCHÖNGART, 2020), de 0,6 a 0,7ºC (GLOOR *et al.*, 2015; MARENGO *et al.*, 2018), ou até mesmo 1ºC (NOBRE *et al.*, 2016). Além disso, as projeções climáticas para a Amazônia mostram que, até 2040, a temperatura média poderá aumentar 1,5ºC além do que já aumentou, ao mesmo tempo que as chuvas se reduzirão em 10%. Já entre 2041-2070, o aumento na temperatura média poderá ficar entre 3ºC-3,5ºC, com diminuição das chuvas entre 25% e 30%. O cenário se agravará ainda mais no período 2071-2100, com o aumento das temperaturas médias entre 5ºC e 6ºC, com queda de 45% nas precipitações (PBMC, 2014). Segundo o IPCC, considerando o aumento na temperatura média entre 2,6ºC e 8,5ºC, as previsões mostram que, por cerca de 60 dias, as temperaturas máximas seriam superiores a 35ºC até o final do século XXI. Já no cenário mais pessimista, o aumento passaria para mais de 150 dias com estas altas temperaturas (IPCC, 2021b).

Outro aspecto que as MC globais podem mudar na Amazônia é a ocorrência de eventos menos usuais, por exemplo, acentuando a ocorrência de eventos climáticos extremos, como secas ou inundações severas (MARENGO *et al.*, 2022). Tais eventos climáticos extremos na Amazônia não são somente causados por mudanças locais, ou seja, que ocorrem no perímetro da Amazônia, mas decorrem também de alterações globais nas temperaturas médias dos oceanos Pacífico e Atlântico (IPCC, 2018). Tais mudanças transformam a circulação atmosférica em grande escala, assim como influenciam a quantidade de vapor d'água da troposfera (GLOOR *et al.*, 2015), podendo acentuar a ocorrência desses eventos.

Dois contextos antagônicos podem ser responsáveis por secas extremas na Amazônia ou, pelo contrário, por inundações, pois afetam o regime de chuvas global. Primeiro, eventos El Niño ou, mais precisamente, El Niño-Oscilação Sul – ENOS, que ocorrem quando o oceano Pacífico Equatorial está mais quente do que o normal, ao mesmo tempo que há aumento anormal da temperatura oceânica no Atlântico Norte tropical (MARENGO *et al.*, 2008, 2022). O ENOS afeta o continente sul-americano de maneira espacialmente não homogênea, além da dependência temporal/sazonal (TOWNER *et al.*, 2020). Os eventos El Niño causam secas extremas, como ocorreu em 2005 na Amazônia brasileira (MARENGO *et al.*, 2008), 2010 (ARAGÃO *et al.*, 2018)

e em 2015 na Amazônia peruana (JIMÉNEZ-MUÑOZ *et al.*, 2016). Segundo, os fenômenos associados à La Niña que, ao invés de reduzirem as chuvas, provocam seu aumento extremo. Esses eventos ocorrem quando o oceano Pacífico Equatorial está mais frio do que o normal, podendo causar inundações extremas (MARENGO; ESPINOZA, 2016). Nas regiões norte e nordeste da região amazônica, as inundações extremas têm se tornado frequentes, como ocorreu em 2009, 2011, 2012, 2013, 2014 (GLOOR *et al.*, 2015; MARENGO; ESPINOZA, 2016) e em 2015 (MARENGO; ESPINOZA, 2016). Portanto, esses dois eventos ocorrem periodicamente e em anos diferentes, a depender da temperatura no oceano Pacífico Equatorial, podendo causar ou não eventos climáticos extremos.

Porém, as MC são graduais e não ocorrem isoladamente, o que complica ainda mais a situação. Na Amazônia brasileira, os impactos das mudanças ambientais se agravaram nos últimos anos, por outras mudanças ambientais e de governança.

Dentre as mudanças ambientais, o desmatamento ocupa lugar de destaque nesse cenário pelo seu aumento considerável nos últimos anos. Quando considerada a Amazônia Legal no Brasil, o desmatamento passou de 4.571 quilômetros quadrados (km²), em 2012, para 7.536 km², em 2018, atingindo 13.235 km² em 2021 (INPE, 2022a), resultando, portanto, em incremento de 65% entre 2012 e 2018 (WALKER *et al.*, 2020). O desmatamento na Amazônia tem impactos no clima local e global, acentuando o aquecimento local, pois aumenta a temperatura na superfície da terra (MAEDA et al., 2021). Por exemplo, resultados de estudo na região de Alta Floresta, no estado de Mato Grosso - Brasil, mostram que as áreas desmatadas eram sempre mais secas e quentes (de 5% a 10% mais quente), com aumento médio de 2ºC durante o dia em relação às áreas de floresta (DUBREUIL *et al.*, 2012). O desmatamento tende também a prolongar o período da estação mais seca (FU; LI, 2004), a gerar precipitações mais severas na estação chuvosa (DUBREUIL *et al.*, 2012) e a causar a diminuição no volume total das precipitações, principalmente em áreas com agricultura de *commodities* em larga escala (MAEDA *et al.*, 2021).

Os efeitos do desmatamento para o clima local dependem do (i) tamanho da área desmatada e (ii) da heterogeneidade da vegetação que recobre o solo. Pequenas áreas desmatadas (~1 km^2) não geram grandes alterações na evapotranspiração das florestas, quando comparadas às grandes áreas desmatadas (≥200 km^2) (CHAMBERS; ARTAXO, 2017). A heterogeneidade da cobertura do solo e a rugosidade da superfície florestal associada a esta podem também influenciar as precipitações. A rugosidade do dossel florestal existe quando a cobertura é formada por árvores de

diferentes espécies e idades e, portanto, com diferentes alturas, situação que contrasta com a àquela de vegetações de campo ou monoculturas. Conforme há variações nos tipos de cobertura do solo, o aquecimento da superfície se altera e, a depender da rugosidade, mais ou menos evapotranspiração ocorre e, como consequência, maior ou menor nível de precipitações (CHAMBERS; ARTAXO, 2017). Devido à rugosidade, florestas nativas tendem a promover a formação de mais nuvens pela convecção do ar à atmosfera (CHAMBERS; ARTAXO, 2017).

Por fim, vale lembrar que, além dos impactos locais, o desmatamento acirra as MC globais, pois afeta o balanço de gás carbônico na atmosfera. De fato, estudo que avaliou as emissões originárias do desmatamento das florestas amazônicas no Brasil, Bolívia, Colômbia, Equador, Peru e Venezuela mostrou que ocorreu aumento de 200% entre 2012 e 2016 (WALKER *et al.*, 2020).

O segundo fator que agravou o cenário recente na Amazônia foram as mudanças na governança no Brasil que favoreceram o aumento no desmatamento e crescimento de outras atividades ilegais na região (MATAVELI *et al.*, 2022; OLIVEIRA *et al.*, 2022). Em sua última gestão, encerrada ao final de 2022, o governo federal foi conivente com a grilagem de terras e, inclusive, respaldou atividades degradantes e contrárias à preservação florestal e à sobrevivência de populações tradicionais (FERRANTE; FEARNSIDE, 2019), como o desmantelamento dos órgãos de fiscalização federais e afrouxamento das regras de controle (BEGOTTI; PERES, 2019; LIMA *et al.*, 2020). Por exemplo, territórios indígenas demarcados ou não (23% da Amazônia Legal são ocupados por 424 terras indígenas) (ISA, 2021) têm sido invadidos e estão sob constante ameaça de garimpeiros, madeireiros e fazendeiros (FAO; FILAC, 2021; FERRANTE; FEARNSIDE, 2019), sobretudo em anos recentes com a conivência do governo federal. Só em 2021, mais de 6 milhões de hectares em Terras Indígenas e Unidades de Conservação estavam ameaçados pelo garimpo de ouro. (CIMI, 2021).

Toda essa conjuntura de MC locais e globais, assim como a perda e a fragmentação de habitats florestais e o afrouxamento da vigilância, aumentaram o risco de dois cenários que tendem a retroalimentar o problema: incêndios e savanização das áreas florestadas.

Variações na duração e no período da estação seca influenciam a frequência de ocorrência de incêndios, sendo que em 65% da Amazônia seu maior número é observado entre agosto e outubro (CARVALHO *et al.*, 2021). Com o prolongamento da estação seca atualmente observado, o risco de ocorrência de incêndios na região tende a aumentar (ARAGÃO *et al.*, 2018) ocasionando efeitos diretos e indiretos. Causam danos diretos aos ecossistemas florestais, como o aumento na

mortalidade de árvores (BRANDO *et al.*, 2014) e ameaças à sobrevivência de diversas espécies de mamíferos, aves, répteis, anfíbios e plantas (FENG *et al.*, 2021). Provocam também efeitos indiretos, devido ao aumento na emissão de CO_2 e de outras partículas para a atmosfera, como os aerossóis de origem antrópica. Os aerossóis antrópicos, ou seja, pequenas partículas líquidas ou sólidas suspensas na atmosfera, são perigosos, pois interagem com a radiação solar e com as nuvens, podendo absorver ou dispersar a radiação solar, alterando o equilíbrio de radiação da Terra, aquecendo ou esfriando a superfície terrestre (DAVIDI; KOREN; REMER, 2009), além de interagirem com outras partículas presentes na atmosfera (COSTA *et al.*, 2022b). A emissão de aerossóis antrópicos causa preocupação, pois há incertezas quanto aos seus efeitos potenciais, à sua interação com as nuvens e, por fim, quanto às suas consequências nas MC (PBMC, 2014).

Outro cenário que causa preocupação é a potencial savanização em larga escala das porções sul e leste da Amazônia. Estudos de modelagem sugerem que duas situações poderão levar a pontos de inflexão que resultarão (i) na perda de ecossistemas florestais amazônicos transformados em savanas; (ii) em eventos El Niño mais fortes e (iii) na maior frequência de secas extremas. Esses eventos são previstos, primeiro, se houver aumento de 4ºC na temperatura média global. Segundo, se o desmatamento das florestas superar os 40% da área total da Amazônia (NOBRE *et al.*, 2016), cifra que atualmente está em 17% (INPE, 2022b). Caso o desmatamento alcance esses 40%, prevê-se que ocorrerá uma diminuição de 40% no volume das precipitações de julho a novembro, assim como o prolongamento do período da estação seca (PBMC, 2014). Embora existam naturalmente savanas em certos locais da Amazônia (~87.500 km²), especialmente sobre solos de areia branca, evidências recentes mostram que mesmo na Amazônia central estes ecossistemas já estão se expandindo onde antes havia ecossistemas sazonalmente inundados, devido às queimadas e aos episódios de secas extremas (FLORES; HOLMGREN, 2021).

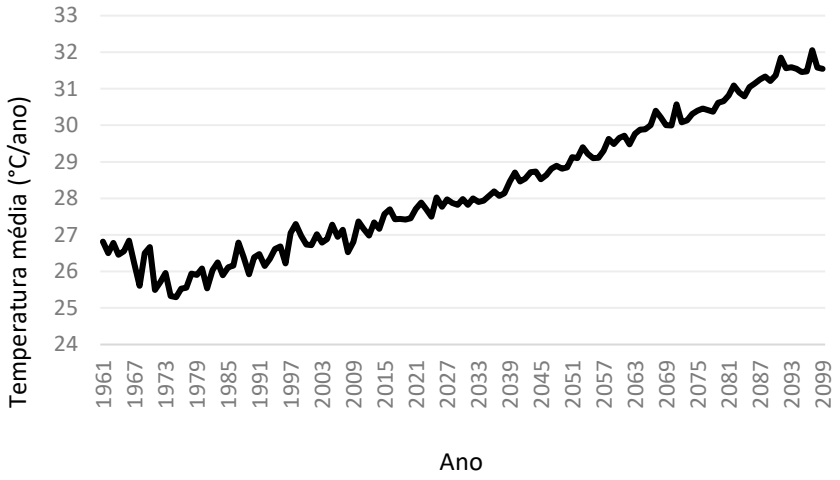
3.2. Cenários climáticos atuais e previstos para a T.I. Wawi

Para a T.I. Wawi, as previsões também sugerem que ocorrerão alterações climáticas, conforme a Figura II.5 e a Tabela II.1 ilustram, por meio dos dados de temperaturas (ºC/ano) e precipitações anuais (milímetros/ano) passados, atuais e previstos para a T.I. Wawi. Conforme os anos se aproximam a 2099, são previstos a partir de ~2021 aumentos das temperaturas médias, podendo passar de ~32 ºC. Também se observa uma diminuição nas precipitações médias, assim como em sua variabilidade, cujos picos superior e inferior são maiores nos anos em que há dados

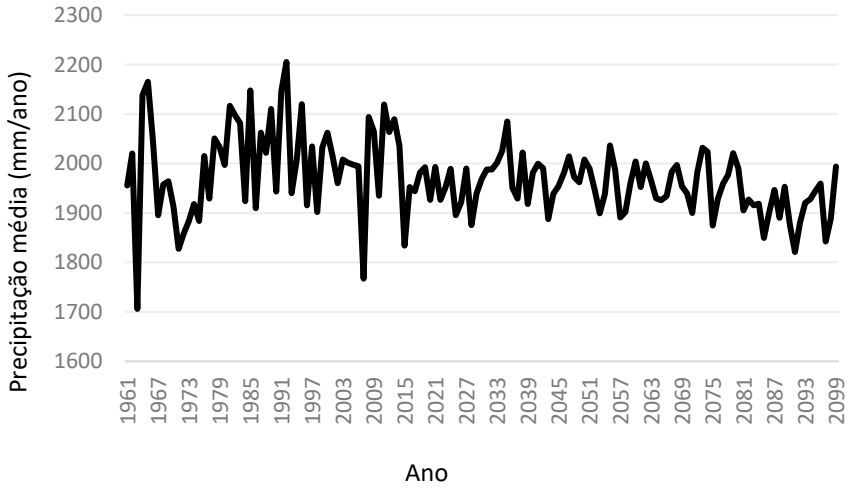
disponíveis, diminuindo desde 2015. Prevê-se que a duração da estação seca aumentará, assim como o risco de eventos extremos de seca e chuva que passam de normal para moderado (THE CLIMATE SOURCE, 2022).

Entre 1961 à 2015, a temperatura média aumentou 0,8ºC e a duração da estação seca aumentou em 0,2 meses. Os cenários para altas emissões de carbono sugerem que, até 2099, a temperatura e a duração da estação seca aumentarão, respectivamente 5,3ºC e 0,8 meses, enquanto a precipitação diminuirá 44 mm (THE CLIMATE SOURCE, 2022).

Figura II.5 – Dados sobre temperatura e precipitação para a T.I. Wawi.



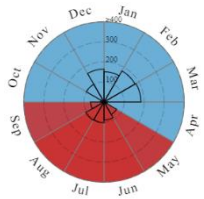
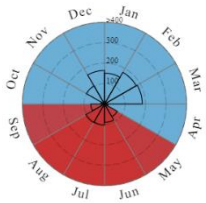
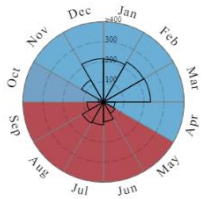
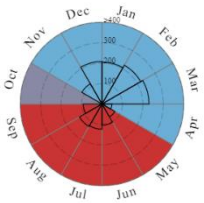
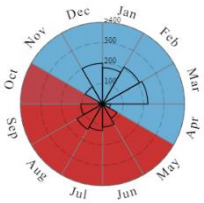
(9a) Temperatura média (passada, atual e prevista) para a T.I.Wawi (graus Celsius).



(9b) Precipitação média (passada, atual e prevista) para a T.I.Wawi (milímetros/ano).

Fonte: THE CLIMATE SOURCE, 2022. Acessado em: 01/11/2022.
Nota: Os anos previstos foram estimados pelo próprio Portal "*The Climate Source*" através do estudo de BACCINI *et al.*, 2017.

Tabela II.1 – Informações climáticas sobre temperatura, precipitação, duração da estação seca, risco de eventos extremos e sazonalidade média para a T.I. Wawi: anos observados e esperados

	Anos observados		**Anos esperados em cenário de altas emissões de Carbono**		
	1961-1990	**1991-2015**	**2016-2039**	**2040-2069**	**2070-2099**
Temperatura média (ºC/ano)	26,1	26,9	28,1	29,5	31,4
Precipitação média (mm/ano)	1985	2022	1976	1976	1941
Duração da estação seca (mês)	4,8	5,0	5,1	5,4	5,6
Risco de eventos extremos de seca (%)	20	22	28	32	36
Risco de eventos extremos de chuva (%)	20	25	29	32	29
Sazonalidade média* (coloração azul: meses da estação chuvosa, coloração vermelha: meses da estação seca)					

Fonte: THE CIMATE SOURCE, 2022. Acessado em: 01/11/2022.
Nota: *imagens extraídas diretamente do Portal "*The Climate Source*".

3.2. Características sociodemográficas dos entrevistados

Dos 109 entrevistados, 56% eram mulheres (n=61) e 44% homens (n=48). A média de idade entre os entrevistados foi de 35 anos (desvio padrão = 14,68), sendo que o entrevistado mais jovem tinha 18 anos e o mais velho 75 anos de idade (para mais detalhes, ver Tabela II.2).

Dentre os entrevistados, cerca de dois terços (72%; n=78) frequentaram a escola da aldeia ou da cidade em algum momento da vida. Homens frequentaram mais (85,42%, n=41) que as mulheres (60.65%, n=37) e quanto maior a idade, menor a escolaridade.

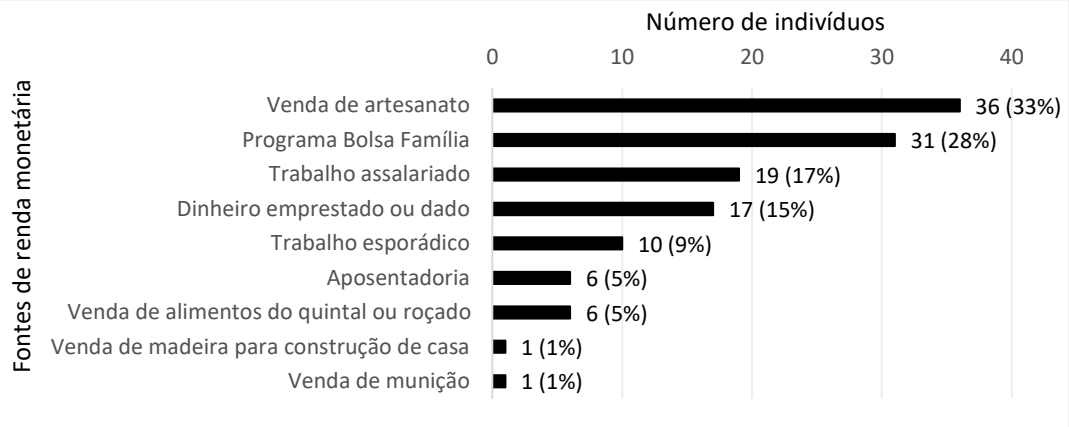
Tabela II.2 – Características sociodemográficas dos 109 entrevistados

Variáveis	Definição	N	Tendência central	Desvio padrão	Mínimo	Máximo
Sexo	Sexo do indivíduo: 0=Mulher; 1=Homem	109	Mo=0 (55,96%)	n.a.	0	1
Idade	Idade do indivíduo em anos	109	Me=35,22	14.68	18	75
Escolaridade	*Dummy* para indivíduo ter estudado na escola da aldeia ou da cidade em algum momento da vida: 0=Não; 1=Sim.	109	Mo=1 (71.56%)	n.a.	0	1
Renda monetária	*Dummy* para indivíduo ter recebido algum dinheiro entre agosto de 2018 a agosto de 2019.	109	Mo=1 (82,57%)	n.a.	0	1
Renda monetária média	Renda monetária recebida por indivíduo entre agosto de 2018 a agosto de 2019.	109	Me=3.322,48	5.731,98	15	32.400
Renda monetária mês	Renda monetária recebida por indivíduo no último mês (julho a agosto de 2019).	109	Me=552,57	633,83	20	2.600

Nota: n.a.=não se aplica. Me=média; Mo=moda.

Nos anos de agosto de 2018 a agosto de 2019 (último ano), 82% dos entrevistados (n=90) haviam recebido algum dinheiro. As fontes de renda monetária mais comuns foram a venda de artesanato, Programa Bolsa Família (PBF), trabalhos assalariados como professor e agente de saúde e dinheiro emprestado ou doado por algum familiar ou amigo (Figura II.6).

Figura II.6 – Recebimento de fontes de renda monetária entre os entrevistados (n=109)



Nota: Um indivíduo pode receber mais de uma fonte de renda monetária.

3.3. Indicadores tradicionais do clima

Os Khĩsêtjê utilizam o conhecimento tradicional sobre vários sinais da natureza para prever em qual período do ano iniciarão as épocas de seca e chuva, estimativas que equivalem a previsões de curto prazo como dias/semanas (Tabela II.3). Os indicadores físicos incluem observações sobre (1) constelações[23] e seu posicionamento no céu (Figura 7a); (2) o início da queda no nível do rio, que indicaria o início da seca e (3) o início do sopro de ventos, delimitando o início da seca. Já aqueles biológicos são mais variados, como: (1) a queda de flores e florescimento de certas árvores que indicariam o início das chuvas (e.g., ver Figuras 7b, 7c e 7d), como o murici-do-mato (*Byrsonima crassifólia (L.)* Rich*)* e pequi (*Caryocar brasiliense* Camb), ou o início da seca, como a cabaça (*Lagenaria siceraria*), urucum (*Bixa orellana*) e murici-do-mato (*Byrsonima crassifólia (L.)* Rich*)*; os sons produzidos por animais, como (2) o canto das cigarras, que emitem sons diferentes a depender do período do ano; (3) o coaxar de sapos, e.g., sapo-cururu (*Rhinella marina*); (4) o canto de aves, como o socozinho (*Butorides striata;* tõtõ na língua) e jaó (*Crypturellus*

[23] Segundo os Khĩsêtjê, há uma constelação conhecida como Mbôtxihra, onde é retratada uma onça atacando um veado. Também mostra a anta, a sucuri, os gêmeos e o ser de duas cabeças Khukhrãtxi. Quando o Mbôtxihra está mais ao lado norte e a onça aparece mais ao lado sul, ao amanhecer, significa o início das chuvas (época da chuva) (SUYÁ *et al.*, 1999). Já quando as chuvas cessam (época da seca), a constelação fica no meio do céu, bem centralizada.

undulatus), que indicariam o início das chuvas, enquanto que o canto da alma-de-gato (*Piaya cayana;* wekã na língua) e do bacurau (*Hydropsalis albicollis)* indicariam o início da época de seca; e (5) a presença de insetos como borboletas na beira dos rios, indicando o início da seca (Figura 7e).

Não apenas os Khĩsêtjê, mas populações de pequena escala ao redor do mundo também utilizam indicadores tradicionais semelhantes para previsões climáticas e a tomada de decisão sobre atividades de subsistência (ITICHA; HUSEN, 2019; MUSHIMBEI; LIBANDA, 2022; NKUBA *et al.*, 2020), variando conforme a região em que se encontram e a disponibilidade de recursos (ver Tabela II.3). Por vezes, tais indicadores são, inclusive, empregados em conjunto com métodos de previsão científicos (ANKRAH; KWAPONG; BOATENG, 2022; STREEFKERK *et al.*, 2022).

Porém, para algumas populações de pequena escala, existe atualmente certa desconfiança no uso desses indicadores, devido à baixa consistência entre o que é previsto e o que de fato ocorre, como é o caso de comunidades em Gana (ADANU; ABOLE; GBEDEMAH, 2022), Bolívia (BAUER; DE JONG; INGRAM, 2022) e na África do Sul (JIRI *et al.*, 2016). Problema equivalente parece estar ocorrendo com os Khĩsêtjê. Segundo eles, os indicadores para o início da época de chuva continuam os advertindo de forma adequada e, sendo assim, são utilizados por 70% dos entrevistados. Já aqueles os indicadores para o início da época de seca são utilizados por porcentagem substancialmente menor (54% dos entrevistados ainda o utilizam), o que condiz com as alterações na duração dessa estação previstas pelo portal *The Climate Source* (THE CLIMATE SOURCE, 2022).

Mesmo que as MC afetem todas as atividades de subsistência, os indicadores tradicionais relatados parecem ser importantes principalmente para a atividade agrícola, pois esta exige planejamento prévio. Outras atividades, como caça, pesca e coleta de produtos da floresta, são menos relatadas, talvez por serem atividades muitas vezes oportunistas e que não necessitam de planejamento de longo prazo, além da inviabilidade de se controlar o processo.

O uso de indicadores tradicionais para tomada de decisão em populações de pequena escala é importante (BALEHEGN *et al.*, 2019; KOM *et al.*, 2022; RADENY *et al.*, 2019), embora aponte que alguns deles poderão se tornar problemáticos com a ocorrência das MC devido a duas razões principais.

Primeiro, devido aos efeitos das MC serem imprevisíveis e estarem associados a eventos climáticos extremos, a aplicabilidade de alguns dos indicadores climáticos tradicionais, mas não

todos, possivelmente deixará de ser confiável para previsões (GUIDO *et al.*, 2021; GWENZI *et al.*, 2016). Por exemplo, enquanto o posicionamento das constelações continuará a indicar o mesmo momento do ano, independente da ocorrência das MC e de seus eventos climáticos extremos, o florescimento de algumas espécies arbóreas pode ser alterado, afetando a sua serventia como indicador tradicional. Portanto, haveria uma mudança no período de floração, podendo afetar sua duração e o período de ocorrência. Dado o comportamento possivelmente errático das MC, as épocas de chuva e de seca devem se tornar de fato menos previsíveis, independentemente do método utilizado. Logo, indicadores tradicionais como contar o número de dias de chuva, ou adiar o mês de plantio, podem deixar de ser métodos adequados para uma boa previsão (HOSEN; NAKAMURA; HAMZAH, 2020). Isso significa que a utilização desses indicadores poderá levar a estratégias mal adaptadas às MC (BASDEW; JIRI; MAFONGOYA, 2017).

A segunda razão está relacionada ao fato de o conhecimento tradicional poder estar adaptado a uma condição que não é aquela atual (SON; CHI; KINGSBURY, 2019). Ou seja, o conhecimento acumulado e transmitido entre gerações refere-se a uma certa condição passada que deve diferir da nova condição, uma vez que o conhecimento transmitido provém do acúmulo de muitos anos de observações (BERKES; BERKES, 2009).

Figura II.7 – Indicadores tradicionais utilizados pelos Khĩsêtjê.

(7a) Noite estrelada na época da seca na aldeia Khĩkatxi.

(7b) Árvore de flor amarela denominada *turêtxi* que indica o início da época da chuva.

(7c) Árvores hwĩsambakhêrê (flor roxa) e turêtxi (flor amarela) que indicam a época da chuva.

(7d) Árvore de flor roxa denominada de ndakratxi que indica a época da chuva.

(7e) Borboletas na beira do rio indicando o início da época da seca.

Fonte: Flávia Milhorance, 2022 (Figura 7a) e Lia Taruiap Troncarelli, 2019 (Figuras 7b a 7e).

Tabela II.3 – Indicadores físicos e biológicos utilizados para prever o período do ano (início das épocas de seca e de chuva)

Sinal da natureza	Tipo de indicador	O que indica?	Exemplos de citações dos entrevistados	Exemplos de referências semelhantes na literatura
Constelação	Físico	Início da época de seca	"Tem uma estrela que se chama 3 marias, e outra que são 7 estrelas juntas, elas são irmãs, indicam sinal de chuva. Quando as 7 estrelas estão quase no horizonte, quase desaparecendo é que acabou a época da chuva" (entrevistado 326). "Tem uma estrela bem grande que sobe no sentido do rio para a aldeia, chamada de *Kumanhõrotxi*, que mostra que a chuva está chegando" (entrevistado 242).	• Observação das Plêiades previsor de seca (GAVIÃO *et al.*, 2019). • Observação do céu (e.g., arco-íris): previsor de tempestade (KIEU *et al.*, 2020). • Observação de estrelas: previsor de chuva e de dias ensolarados (VAN HUYNH *et al.*, 2020). • Movimento de estrelas: previsor de chuva (escassez) (KANWAL; SIROHI; CHAND, 2021).
		Início da época de chuva	"A via láctea vira de sentido quando está chegando a época da seca" (entrevistado 26) "Quando a constelação que estava no meio do céu chega no horizonte, em direção ao rio, indica que vai começar o tempo da seca" (entrevistado 69).	• Observação do céu (e.g., arco-íris, presença de estrelas): previsor de calor e seca (KIEU *et al.*, 2020). • Movimento de estrelas: previsor de chuva (abundância) (KANWAL; SIROHI; CHAND, 2021). • Observação das Plêiades previsor de quando e quanto choverá na época da chuva (AIKANÃ *et al.*, 2019; ORLOVE; CHIANG; CANE, 2002; ZORÓ *et al.*, 2019).
Canto da cigarra	Biológico	Início da época de seca	"No início da seca tem outra cigarra com outro canto, diferente, assobiando bem forte, cigarra bem pequena, meio cinza" (entrevistado 320).	• Cigarras na floresta: previsor de sol (BAUER; DE JONG; INGRAM, 2022). • Som de insetos à noite (como grilos): previsor de que não haverá chuva (TUME; KIMENGSI; FOGWE, 2019). • Gafanhotos: previsor de diminuição das chuvas (NKUBA *et al.*, 2020).
		Início da época de chuva	"A cigarra canta quando chega perto da chuva. Ela fica 15 dias ou duas semanas cantando com diferentes vozes. Tem a voz mais fina e a voz mais grossa. Quando ela começa a	• Canto da cigarra: previsor do verão e de chuva (AIKANÃ *et al.*, 2019; ARARA *et al.*, 2019; GAVIÃO *et al.*, 2019).

Sinal da natureza	Tipo de indicador	O que indica?	Exemplos de citações dos entrevistados	Exemplos de referências semelhantes na literatura
			cantar forte e grosso, a chuva está se aproximando" (entrevistado 327). "Cigarra também é sinal que vai chover, tem canto fino, agudo, está chamando a chuva, indica que amanhã ou depois vai chover" (entrevistado 326).	
Florescimento de certas árvores:	Biológico	Início da época de seca	"A flor da árvore *turêtxi* e uma flor amarela que dá no cipó chamada de *ankrokhájngran* indicam a chegada da época da seca. Tem também a árvore *pejakhôtxi*, que dá uma flor bem amarela do tamanho de dois palmos da mão e a árvore *roptuá*, que dá uma flor branca pequena no mato, do tamanho da palma da mão. *Hwĩsambakrety* também indica, dá uma flor roxa e suas folhas são usadas para lixar panelas de cerâmica, colares e anéis de tucum" (entrevistado 212). "Na época da seca dá a flor amarela chamada de *taranyaty*" (entrevistado 204). "Quando a árvore chamada de catarro de tracajá "*khahrãnhõkrejrá*", que fica na beira do rio e no campo, começa a dar flor amarela é que está na época da seca" (entrevistado 326). "Quando a árvore *hwĩkajngô* dá flor amarela e ela cai, indica que vai começar a época da seca" (entrevistado 303).	• Florescimento de algumas espécies arbóreas: previsor de verão (MANH; AHMAD, 2021a, 2021b), de seca (VAN HUYNH *et al.*, 2020) e estiagem (MUSHIMBEI; LIBANDA, 2022).
		Início da época de chuva	"Quando caem as flores nas cores rosa e roxo da árvore que tem folha lixa, chamada *hwĩsambakhêrê* indica a chegada das chuvas" (entrevistado 204). "Quando termina de cair as flores da árvore *ndakratxi* indica que vem chuva" (entrevistado 49). "Quando caem as flores da árvore *turêtxi*, chamada de ipê indica que vai chover" (entrevistado 308). "Quando o ipê começa a florescer indica a chegada das chuvas" (entrevistado 260).	• Florescimento de algumas espécies arbóreas: previsor de chuva (ADAAWEN, 2021; KANWAL; SIROHI; CHAND, 2021; MALIKI; PAULINE, 2022; MUSHIMBEI; LIBANDA, 2022; SORGHO *et al.*, 2020). • Frutificação de algumas espécies arbóreas: previsor de chuva (INMAN; HOBBS; TSVUURA, 2020; MUGAMBIWA; RUKEMA, 2020; SORGHO *et al.*, 2020).

Sinal da natureza	Tipo de indicador	O que indica?	Exemplos de citações dos entrevistados	Exemplos de referências semelhantes na literatura
Teia de aranha	Biológico	Início da época de seca	"A aranha quando passa sua teia em todos os lugares no mato está indicando que vai chegar a época da seca". (entrevistado 212).	• Aranha quando cobre ou não o seu buraco: previsor de chuva ou de seca (METCALFE *et al.*, 2020).
Coaxar de sapos	Biológico	Início da época de seca	"O sapo que chamamos de *ngramy* quando começa a cantar está indicando o início da seca" (entrevistado 316). "O sapo cururu começa a cantar quando inicia a época da seca" (entrevistado 29).	• Coaxar de sapo: previsor de rio secando e frio (ARARA *et al.*, 2019).
		Início da época de chuva	"Quando o sapo-cururu canta está próximo de chover, pois está chorando" (entrevistado 34).	• Coaxar de rã/sapo: previsor de chuva (AIKANÃ *et al.*, 2019; BAUER; DE JONG; INGRAM, 2022; DUARTE *et al.*, 2019; MANH; AHMAD, 2021a, 2021b; VAN HUYNH *et al.*, 2020; ZORÓ *et al.*, 2019).
Canto de aves	Biológico	Início da época de seca	"Um sinal do início da época da seca é o som do pássaro chamado socozinho, chamado de *tõtõ*. Ele faz um som como se estivesse vomitando" (entrevistado 253).	• Canto de aves: previsor de seca (MANH; AHMAD, 2021a; SURUÍ *et al.*, 2019; ZORÓ *et al.*, 2019).
		Início da época de chuva	"Os pássaros que indicam o início das chuvas se chamam na língua *wekã* e *wakrã*. Eles cantam uma vez para indicar que vai acontecer alguma coisa e chover" (entrevistado 191). "O pássaro sabiá canta vários dias seguidos e avisa que vai chover" (entrevistado 268). "Tem um pássaro que canta antes de chover, marrom, chamado *hwykra*. Ele canta e a tarde a chuva vem. O sabiá canta quando vai começar o início da época da chuva" (entrevistado 284). "Tem uma ave que começa a cantar quando vai iniciar as chuvas chamada de *sipere*" (entrevistado 316). "Pássaro chamado de *ngôjrio* canta de dia e a noite chove" (entrevistado 383).	• Canto de aves: previsor de chuva e tempestades (ARARA *et al.*, 2019; BAUER; DE JONG; INGRAM, 2022; DUARTE *et al.*, 2019; METCALFE *et al.*, 2020; TUME; KIMENGSI; FOGWE, 2019). • Aparecimento de algumas espécies de aves: previsor de chuva (ADAAWEN, 2021; MALIKI; PAULINE, 2022).

Sinal da natureza	Tipo de indicador	O que indica?	Exemplos de citações dos entrevistados	Exemplos de referências semelhantes na literatura
Borboletas na beira do rio	Biológico	Início da época de seca	"As borboletas na beira do rio é um sinal do início da época da seca" (entrevistado 101).	• Aparição de borboletas coloridas: previsor de chuva (KANWAL; SIROHI; CHAND, 2021). • Borboletas voando de leste para oeste: previsor de desastres climáticos (MUGAMBIWA; RUKEMA, 2020). • Aparição de mariposas à noite: previsor de chuva (ARARA *et al.*, 2019). • Borboletas brancas voando de norte a sul: previsor de chuva (ADANU; ABOLE; GBEDEMAH, 2022).
Nível do rio	Físico	Início da época de seca	"Quando o rio começa a baixar e as folhas secas caem na água parada é sinal do início da época da seca" (entrevistado 217). "Quando acaba a chuva forte vem a chuva de passagem, bem fina, nós já sabemos que está começando a secar. O rio no mato começa a parar, juntar folhas, a água fica parada, vai chegando o tempo da seca, mesmo com chuva de passagem. Hoje não funciona mais, mudou, as coisas que conheci pelo meu pai mudaram. Os sinais do tempo e das estrelas mudaram" (entrevistado 326).	• Vazão do rio: previsor de chuva (NKUBA *et al.*, 2020).
Vento	Físico	Início da época de seca	"O vento sempre chega na época da seca, chega bem leve, dá para sentir o frio e é um sinal de que não vai chover mais. Funciona, mas atrasa" (entrevistado 20). "Começa a ventar no início da época da seca" (entrevistado 21).	• Vento vindo do Norte: previsor de chuva (BAUER; DE JONG; INGRAM, 2022). • Vento vindo do leste e oeste: previsor de chuva (abundância ou escassez) (INMAN; HOBBS; TSVUURA, 2020). • Vento forte: previsor de chuva (MALIKI; PAULINE, 2022). • Mudança na direção do vento: previsor de chuva (abundância ou escassez) (ITICHA; HUSEN, 2019; KANWAL; SIROHI; CHAND, 2021; MUSHIMBEI; LIBANDA, 2022).

Além do uso dos indicadores tradicionais detalhados acima, os Khĩsêtjê observam o comportamento das primeiras chuvas para decidir quando a época úmida começou (Tabela II.4) e, sendo assim, que é o período ideal para iniciar o calendário agrícola com o plantio da mandioca no roçado (Tabela II.5). Porém, os indicadores variaram a depender do entrevistado. Para o início da época de chuva, o indicador mais saliente foi considerado quando "chove todos os dias durante uma semana" (31%). Já para indicar o momento ideal de iniciar o plantio de mandioca no roçado, o momento mais citado foi o "primeiro dia de chuva forte" (43%).

Resultado equivalente foi encontrado apenas entre agricultores de pequena escala na Zâmbia (WALDMAN *et al.*, 2019). Nesse estudo, maior porcentagem da população considerou os primeiros dias de chuva forte como de início da época da chuva. Quanto ao plantio, as pessoas variaram entre esperar alguns dias de chuva consecutiva para plantar no roçado, ou plantar após o primeiro dia de chuva forte (WALDMAN *et al.*, 2019).

Tabela II.4 – Descrição do que é considerado o início da época da chuva para os Khĩsêtjê

Descrição do que é considerado o início da época da chuva	**Frequência (%)**
Uma semana chovendo todos os dias	31%
No primeiro dia que começa a chover forte	15%
Segunda chuva após terem passado um ou mais dias sem chover. A primeira chuva seria fraca e passageira, ideal para queimar o roçado. Após um ou mais dias sem chover, choveria novamente pela segunda vez de maneira mais forte, apagando o fogo colocado no roçado	13%
Segunda chuva após terem passado de uma a quatro semanas desde a primeira chuva. Após essa segunda chuva, choveria vários dias seguidos.	7%
Observação do movimento e tamanho das nuvens, que indicariam que choverá forte	6%
Após alguns dias seguidos de chuva, por exemplo, dois a quatro dias seguidos chovendo	4%
No mês de setembro é o início da época da chuva	4%
Terceira chuva, i.e. quando chove pela terceira vez	4%
Observação da posição das estrelas indica quando será o início da época da chuva	3%
Um mês chovendo todos os dias	3%
Não sabe, por conta disso, espera que outra pessoa avise quando é o início da época da chuva	3%
Primeira chuva, mesmo que seja fraca	2%
Barulho de trovão, mesmo que o céu esteja sem sinal de chuva	2%
Fumaça das queimadas no roçado faz chover	1%
Quando começa a cair o pequi - *Caryocar brasiliense* Camb	1%
Quando o dia está muito quente	1%

Apesar de certas divergências (ver Tabela II.5), observa-se que, em mais da metade das respostas, o início do plantio no roçado teve relação com as chuvas para os Khĩsêtjê. Para pequenos agricultores na Zâmbia foi observado algo similar. O conhecimento de quando plantar dependia de observações transmitidas entre gerações sobre a relação entre as chuvas e o plantio. Por exemplo, qual produto ou quando brotariam os produtos agrícolas e a quantidade do que seria produzido (MUSHIMBEI; LIBANDA, 2022).

Tabela II.5 - Descrição do que é considerado o início do plantio de mandioca no roçado para os Khĩsêtjê

Descrição de quando é o momento de iniciar o plantio de mandioca na roça	**Frequência (%)**
Primeiro dia que começa a chover forte	43%
Após alguns dias consecutivos de chuva, e.g., dois a quatro dias seguidos chovendo	13%
Na segunda chuva	9%
Espera quando as chuvas não param de cair, i.e. chove todos os dias há mais de uma semana	8%
Depois da primeira chuva	5%
Depois de queimar a roça	4%
Planta antes de chover	4%
Mês de setembro	3%
Pais e família que decidem quando plantar	3%
Mês de novembro	2%
Segue sinais da natureza, e.g., observação das árvores brotando, canto das cigarras, intensidade dos ventos	2%
Terceira chuva	1%
Quinta chuva	1%
Mês de outubro	1%
Segue uma data considerada especial pela família, cujos parentes plantavam nos anos anteriores	1%

Os resultados também indicam que vêm ocorrendo mudanças na forma de tomada de decisão quanto ao calendário agrícola de preparação e plantio dos roçados. Anteriormente, os Khĩsêtjê faziam a roçada e derrubada de árvores para preparação das roças entre abril e maio, mas atualmente, postergaram para junho. Já as queimadas eram realizadas no início de setembro, enquanto atualmente passaram para o final do mesmo mês. A época de plantio também foi alterada. Segundo alguns entrevistados, antigamente, parte dos Khĩsêtjê plantava antes de as chuvas iniciarem, outra parte esperava a primeira chuva, mesmo que de intensidade fraca, e outros esperavam o mês de setembro. Atualmente, contudo, é mais comum esperar chover vários dias seguidos para plantar (variando entre o número de dias) ou até mesmo adiar o plantio para o mês seguinte (para além de setembro), como garantia de que choverá e que as plantas nascerão. Essa

mudança condiz com os resultados que indicaram que 67% dos entrevistados tiveram experiências prévias negativas, pois plantaram os roçados e não choveu o bastante para que as plantas crescessem.

O resultado também reflete ocorrências com outros povos indígenas na Amazônia e outras partes do mundo. Também residentes do leste amazônico, os Ikpeng da região do Xingu em Mato Grosso têm igualmente percebido que não tem chovido no período do ano esperado. Com isso, as ramas de mandioca plantadas não nascem, pois são queimadas pelo sol, o que tem levado à maior dependência por alimentos comprados nas cidades (URZEDO *et al.*, 2017). Eventos similares foram observados também na África, ao menos em população de pequena escala em Gana, onde a previsão de chuva através dos indicadores tradicionais tornou-se ineficaz. Nesse estudo, a ausência de chuvas após o plantio também levou ao não brotamento das sementes plantadas (ADANU; ABOLE; GBEDEMAH, 2022).

A imprevisibilidade e as mudanças no calendário da atividade agrícola têm sido relatadas em outros povos indígenas da Amazônia e em outros locais do mundo. Todavia, no oeste da Amazônia, ao invés da seca, povos indígenas como os Baniwa enfrentaram, em 2022, cheia acima do normal que provocou alagamento das roças e perda da produção agrícola (CARDOSO, 2022). Cheia extrema afetou também outros povos indígenas do oeste amazônico, como os Yaminawá, Huni Kuin e Yawanawá, no Acre (PONTES, 2022).

Em outras regiões do mundo, mudanças nas estações de frio e calor têm também impactado a atividade agrícola, como nos Tuareg do continente africano, onde a estação de cultivo de trigo tornou-se mais curta (MIARA *et al.*, 2022). No Nepal, o povo indígena Thami tem enfrentado problemas na colheita agrícola pelo aumento de pragas e devido à seca. Tais mudanças fizeram com que nada crescesse na roça, levando ao baixo sustento de alimentos para a população local (THAPA, 2019). Entre o povo Hmong, no Vietnã (KIEU *et al.*, 2020) e entre os Guarani, na Bolívia (DÁVALOS, 2017), o aumento do período da seca e a imprevisibilidade das chuvas têm afetado a produtividade e o momento ideal para a colheita agrícola.

3.4. Percepção sobre mudanças no clima

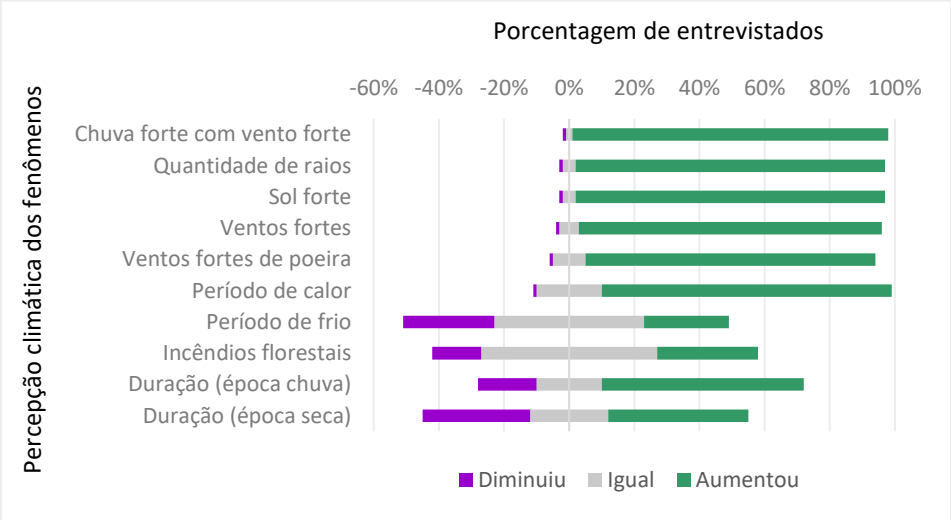
Entre os 109 entrevistados, 91% relataram que o clima está mudando, sendo que a percepção foi semelhante entre mulheres (~92%, n=56) e homens (~89%, n=43) (Tabela II.6).

Tabela II.6 – Percepção das mudanças climáticas por sexo e idade (n=109)

Sexo / Idade	Homens (n=48)		Mulheres (n=61)	
	Não	**Sim**	**Não**	**Sim**
18 a 29 anos	22.22%(n=4)	77.78%(n=14)	9.68%(n=3)	90.32%(n=28)
30 a 59 anos	4%(n=1)	96%(n=24)	3.85%(n=1)	96.15%(n=25)
>60 anos	0%(n=0)	100%(n=5)	25%(n=1)	75%(n=3)
Total	10.42%(n=5)	89.58%(n=43)	8.20%(n=5)	91.80%(n=56)

Os Khĩsêtjê têm percebido mudanças graduais principalmente na temperatura, precipitação, quantidade de raios e intensidade dos ventos. Segundo os entrevistados, ao compararem as condições climáticas atuais com aquelas da própria infância, houve um aumento nas chuvas fortes com ventos fortes (97%), na quantidade de raios observada quando chove (95%), no sol forte (95%), nos ventos fortes que podem derrubar casas (93%), no número de dias seguidos de calor excessivo (períodos de calor – 89%) e nas tempestades de poeira (ventos fortes com poeira - 89%) Apesar de ser contraditório, não houve consenso sobre as durações das épocas de chuva e de seca, embora uma maior porcentagem dos entrevistados tenha percebido que ambas aumentaram e têm durações mais longas ao invés de diminuírem ou permanecerem iguais (Figura II.8).

Figura II.8 – Percepção climática dos entrevistados dos fenômenos climáticos (n=109).



Em consonância com as observações dos Khĩsêtjê, outras populações indígenas e tradicionais de leste a oeste e norte a sul da Amazônia têm percebido eventos similares. Por exemplo, as populações indígenas Yudjá, Kawaiwete e Waurá habitantes do Parque Indígena do Xingu, terra vizinha à T.I. Wawi (leste amazônico), indicaram em outro estudo que o sol está mais

forte e estaria queimando os alimentos e outros produtos da roça (CORRÊA, 2016). Outros povos indígenas no oeste da Amazônia, das regiões norte e nordeste do estado do Amazonas, como os povos Baré do Alto Rio Negro (RAMOS, 2012), Yanomami (CORRÊA, 2018) e indígenas da T.I. Jurubatxi-Teá, no Médio Rio Negro (CORRÊA, 2018), têm percebido um aumento da temperatura e calor do sol de maneira geral (CORRÊA, 2018). Já para populações tradicionais habitantes da Reserva Extrativista (RESEX) do Médio Juruá e Reserva de Desenvolvimento Sustentável (RDS) do Uacari, no norte do Amazonas, a temperatura aumentou durante o período da seca (ESTEVO, 2021), mesma observação do povo indígena Zoró, em Mato Grosso (ZORÓ *et al.*, 2019), dos povos Tupari, Makurap e Kanoê, em Rondônia (DUARTE *et al.*, 2019), e entre os Yawanawá, no Acre (NASCIMENTO, 2013).

Contrário ao apresentado na literatura científica sobre precipitação (CHAMBERS; ARTAXO, 2017; MAEDA *et al.*, 2021; THE CLIMATE SOURCE, 2022), pois o desmatamento tende a reduzir as precipitações (CHAMBERS; ARTAXO, 2017), uma parte grande (97%) dos Khĩsêtjê relatou aumento das chuvas fortes com ventos. Essa percepção não descarta a possibilidade de diminuição na quantidade (volume) total das precipitações, mas demostra a observação de aumento em eventos extremos de chuva. Não encontramos evidências prévias similares sobre a precipitação com populações tradicionais no leste amazônico, apenas para a parte norte e oeste da Amazônia, onde há a possibilidade de inundações severas. Por exemplo, no estado do Amazonas, o povo indígena Baré percebeu que as chuvas estariam mais frequentes (RAMOS, 2012), enquanto para alguns povos indígenas da T.I. Alto Rio Negro, as enchentes não estão acontecendo conforme o esperado e a duração do período da chuva tem sido menor (CORRÊA, 2018). No mesmo estado, as comunidades das RESEX Médio Juruá e RDS do Uacari têm relatado que as enchentes estão mais inesperadas (ESTEVO, 2021), enquanto o povo indígena Huni Kuĩ (Kaxinawá) observou que as enchentes estão maiores e plantações têm sido perdidas por conta disso (CORRÊA, 2018). Já para algumas populações tradicionais do sul da Amazônia brasileira as chuvas diminuíram e estão mais imprevisíveis (DUBREUIL *et al.*, 2017; FUNATSU *et al.*, 2019).

Outro tipo de mudanças relatadas pelos Khĩsêtjê ocorreu na fauna e flora da região que habitam (Tabela II.7). Embora não tenha havido concordância nas respostas sobre muitas dessas mudanças, as causas foram atribuídas principalmente às observações sobre mudanças no contexto onde a T.I. está inserida e não propriamente às MC em si. Por exemplo, entre as causas para a quantidade de animais terem diminuído estavam o desmatamento nas áreas limítrofes das T.I.s e o

envenenamento de animais e peixes que se alimentam de soja contaminada pelo uso de agrotóxicos nas plantações do entorno da T.I.

Estudos com outros povos indígenas habitantes do P.I.X., também no leste amazônico, como os Yudjá, Kawaiwete e Waurá, concordam com as observações dos Khĩsêtjê, atribuindo o aumento do desmatamento no entorno e o consequente aumento da temperatura local, como fatores responsáveis pelas alterações na época de florescimento do pequi (*Caryocar brasiliense* Camb), aumento de pragas como percevejos nas plantações e diminuição na quantidade de borboletas, macacos e cigarras (CORRÊA, 2016). Embora não tenha sido na Amazônia, mas em região de cerrado no estado de Mato Grosso com contexto regional semelhante aos Khĩsêtjê, o povo indígena Manoki, habitante da T.I. Irantxe, associou em estudo prévio as MC ao agronegócio, desmatamento e ao calor, que propiciariam maior ocorrência de incêndios florestais (OPAN, 2018).

O contexto de mudanças extremas no uso do solo na região onde se localiza a T.I. Wawi dos Khĩsêtjê parece influenciar sobremaneira a percepção das pessoas, tornando-se mais evidente do que a própria percepção sobre as MC, uma vez que: (i) o município de Querência esteve entre os dez maiores produtores de soja e milho no Brasil (IBGE, 2021); (ii) o estado de Mato Grosso é o segundo estado da Amazônia Legal que mais desmatou, acumulando 150.151,00 quilômetros quadrados (km²) até 2021 (INPE, 2022a) e (iii) o Brasil é o segundo maior consumidor de agrotóxicos no mundo, dentre os quais estão compostos altamente perigosos (ALBUQUERQUE, 2022). Os impactos dos agrotóxicos na saúde e na contaminação da água, fauna e flora são preocupantes (DIAS *et al.*, 2018) e já são evidenciados em estudos científicos em áreas de lavoura próximo ao Rio Pacas, em Mato Grosso (MARTFELD, 2012) e nos rios dentro do P.I.X. e T.I. Wawi (CERQUEIRA, 2018). Além do efeito dos agrotóxicos, foi comprovado o efeito do desmatamento de longo prazo na diminuição de peixes na bacia do alto rio Xingu (ILHA; ROSSO; SCHIESARI, 2019). Portanto, a percepção dos Khĩsêtjê sobre a diminuição de animais e de peixes pode representar a realidade da T.I. Wawi, não sendo, contudo, apenas consequência esperada do consumo de longo prazo de carne de caça e peixes pelos indígenas, nem resultado direto das MC.

Tabela II.7 – Mudanças observadas na fauna e flora da T.I. Wawi e P.I.X. (n=109 entrevistados).

Mudança observada	**Exemplos de relatos das entrevistas**	**Frequência (%)**	**Descrição de possíveis causas para as mudanças observadas segundo os entrevistados**
Alimentos suficientes para sobrevivência de animais na T.I. Wawi e no P.I.X.	"Os animais comem a soja e tomam água contaminada pelos venenos jogados pelos fazendeiros na soja, por isso estão contaminados" (entrevistado 332). "Por causa da soja estão desmatando a floresta" (entrevistado 368). "Por causa do desmatamento, a comida não está suficiente. Por isso os bichos estão comendo soja e milho das fazendas. Antes era floresta e tinha muita fruta para eles comerem, por isso o porco está comendo muito a nossa roça, antigamente não acontecia isso, hoje acontece às vezes" (entrevistado 120). "Aqui onde vivemos hoje, na terra que reconquistamos, o mato não existia antes quando os fazendeiros ocuparam a nossa área, queimaram muito, acabou as frutas. Aqui queimou duas vezes bem grande, o mato cresce, mas dificulta as frutas e as comidas dos animais" (entrevistado 320). "Quando o tempo não está bom, algumas árvores não dão frutos, por causa do tempo, aí começa a diminuir as frutas. As queimadas também diminuem as frutas, com o tempo muito quente, o calor, algumas frutas estão secando" (entrevistado 350). "Por causa da queimada que teve em 2005, as plantas morreram e estão crescendo ainda" (entrevistado 327).	Sim (60%)	n.a.
		Não (38%)	• Desmatamento • Incêndios florestais • Baixa disponibilidade de alimentos na floresta e rios • Avanço da plantação de soja • Natureza estar mudando • Não indígenas estariam matando os animais
		Depende do animal (2%)	• Baixa disponibilidade de alimentos da floresta para o macaco e a paca (*Cuniculus paca*) se alimentarem. A soja tomou o lugar das florestas. • A água dos rios está suja, portanto não haveria muita comida aos animais, tampouco aos peixes.
Quantidade de animais na T.I. Wawi e no P.I.X.	"A derrubada chegou na divisa da nossa terra e vem apertando nossa mata" (entrevistado 253). "Os fazendeiros estão acabando com o mato, aí os animais vêm pro mato que sobrou na nossa Terra Indígena e hoje o porco está comendo nossa mandioca e a anta quebrando as bananeiras" (entrevistado 49).	Continua igual há 20 anos atrás (44%)	n.a.
		Diminuiu (39%)	• Desmatamento das florestas causado pelos fazendeiros nas áreas limites das T.I.s

Mudança observada	Exemplos de relatos das entrevistas	Frequência (%)	Descrição de possíveis causas para as mudanças observadas segundo os entrevistados
	"Com o desmatamento, o bicho fica sem comida e vai se dividindo em cada pedaço das matas que restaram" (entrevistado 344). "Os animais estão comendo muita soja, por isso estão diminuindo, quando as pessoas matam os animais, se vê a soja dentro do corpo do bicho. A soja está envenenando os animais" (entrevistado 157).		• Baixa disponibilidade de alimentos na floresta e nos rios • Não indígenas estariam matando os animais • Os animais estariam comendo muita soja das fazendas no entorno e isso estaria envenenando-os
		Aumentou (10%)	• Alta disponibilidade de alimentos na floresta e nos rios • Alta reprodução de animais
		Depende do animal (7%)	• Animais que diminuíram: veado, paca (*Cuniculus paca*), cutia *(Dasyprocta aguti*), tatu galinha (*Dasypus novemcinctus*) e os macacos. • Animais presentes em grande quantidade: anta (*Tapirus terrestres*) e os porcos do mato queixada (*Tayassu pecari*) e caititu (*Pecari tajacu*).
Quantidade de filhotes de animais na T.I. Wawi e no P.I.X.	"Arara e papagaio diminuíram" (entrevistado 267). "Os filhotes dos bichos, como anta e paca estão entrando em extinção" (entrevistado 580). "Filhotes dos pássaros jacu, mutum e macuco já nascem desnutridos. Esse ano ainda não vi eles" (entrevistado 49).	Continua igual há 20 anos atrás (95%)	n.a.
		Depende do animal (5%)	• Filhotes das aves jacu e mutum estão nascendo desnutridos. • Filhotes das aves macuco (*Tinamus solitarius*) não foram vistos no último ano, enquanto os das araras e dos papagaios diminuíram. • Filhotes de animais como anta (*Tapirus terrestres*) e a paca (*Cuniculus paca*) estão entrando em extinção.

Mudança observada	Exemplos de relatos das entrevistas	Frequência (%)	Descrição de possíveis causas para as mudanças observadas segundo os entrevistados
Quantidade de peixes nos rios Pacas e Suiá-Miçu.	"Em volta das aldeias tem muitos brancos e fazendeiros pescando" (entrevistado 361). "O rio Suiá-Miçú está com menos peixe fora da Terra Indígena, porque os brancos estão pescando muito, aqui no rio Pacas tem mais peixes" (entrevistado 576). "Os pescadores brancos vêm pescar perto da Terra Indígena, nos afluentes do nosso rio. Quando nós queremos pescar, só depois da aldeia Ngôsokô, mais dentro da Terra Indígena que achamos peixes" (entrevistado 253). "Tem muito barulho dos barcos, o motor passando assusta os peixes. O peixe vai onde tem mais fruta e onde não tem os peixes não querem viver mais lá. Na época da seca, se não tiver chovido muito antes, a lagoa pequena fica muito quente e os peixes como a traíra e o pacu morrem" (entrevistado 350).	Continua igual há 20 anos atrás (42%)	n.a.
		Diminuiu (49%)	• Pesca intensiva, tanto pelos indígenas, quanto pelos não indígenas por haver muitas pousadas de pesca esportiva no entorno da T.I. • Pesca intensiva por não indígenas devido à existência do turismo pesqueiro • Rios estão contaminados e barrentos • Barulho dos motores de barco que assusta os peixes • Baixa disponibilidade de alimentos na floresta e rios • Rio estaria secando • Agrotóxicos usados na soja e no milho estariam matando os peixes, pois são carregados para a água dos rios, contaminando a água.
		Aumentou (7%)	• Alta disponibilidade de alimentos na floresta e nos rios • Maior taxa de reprodução de peixes
		Depende (2%)	• No rio Pacas, os peixes são menores, repetindo o mesmo padrão do passado. No entanto, observaram que no rio Suiá-Miçú os peixes diminuíram na parte que está fora dos limites da T.I.Wawi.
Quantidade de insetos (e.g., formigas, moscas,	"A espécie de gafanhoto com a asa vermelha, que a gente come, antigamente tinha bastante, hoje não tem mais. Era	Continua igual há 20	n.a.

Mudança observada	Exemplos de relatos das entrevistas	Frequência (%)	Descrição de possíveis causas para as mudanças observadas segundo os entrevistados
besouros, gafanhotos, dentre outros) na T.I. Wawi e no P.I.X.	na época de chuva que tinha este tipo de gafanhoto. Antigamente tinha muitas abelhas, enchíamos toda a panela de mel, mas agora é muito pouco. Como diminuíram as flores e o produto que elas pegam para fazer mel, elas pegam muito pouco e dão menos mel" (entrevistado 326) "O gafanhoto bem pequeno que comíamos não tem mais, só o grande que existe, a cigarra também está acabando" (entrevistado 2). "As moscas eu vejo que é diferente, aumentaram em maio e junho" (entrevistado 320). "Têm besouros e moscas que vêm das fazendas de soja, quando plantam milho eles vêm tudo pra cá" (entrevistado 217). "Os fazendeiros usam venenos para matar os insetos e eles não aparecem mais muito na roça, nas estradas das fazendas você via gafanhotos e hoje sumiu tudo" (entrevistado 332). "O trator da soja vem cortando o mato, isso faz com que as moscas brancas voem, caindo bastante no pátio da aldeia" (entrevistado 320). "O veneno colocado na soja chega nas abelhas e mata elas" (entrevistado 63). "Quando eu era pequena tinha muita abelha e mel, hoje em dia quase não se vê, não está tendo árvore grande, por isso não tem muito por aqui" (entrevistado 46) "Com a mudança do clima, com muito calor, as abelhas não reproduzem por falta de flores. A abelha não tem produto para fazer o mel" (entrevistado 326).	anos atrás (74%)	
		Diminuiu (6%)	• Desmatamento • Incêndios florestais • Uso de agrotóxico pelas fazendas de soja e milho que acabam matando os insetos
		Aumentou (2%)	• Alta disponibilidade de alimentos nas florestas
		Depende do inseto (18%)	• Gafanhotos, abelhas e cigarras estão diminuindo ou sumindo devido às mudanças no clima, falta de árvores e uso de agrotóxicos nas fazendas do entorno • Número de moscas e besouros aumentou devido às plantações de soja e milho nas fazendas e ao uso de agrotóxicos
Quantidade de aves na T.I. Wawi e no P.I.X.	"Papagaio tem pouco, periquito e pomba têm muito, o jacu e o mutum estão acabando" (entrevistado 283). "Arara não estou vendo mais" (entrevistado 2).	Continua igual há 20 anos (61%)	n.a.

Mudança observada	Exemplos de relatos das entrevistas	Frequência (%)	Descrição de possíveis causas para as mudanças observadas segundo os entrevistados
		Diminuiu (30%)	• Desmatamento • Baixa disponibilidade de alimentos nas florestas e nos rios • Caça esportiva realizada por não indígenas durante atividade de turismo • Calor excessivo que afeta as aves negativamente • Algumas aves estariam mudando de lugar em busca de alimentos • Aves estariam se alimentando da soja que, segundo eles, as mataria
		Aumentou (7%)	• Alta disponibilidade de alimentos nas florestas e nos rios • Alta taxa de reprodução de aves
		Depende (2%)	• Aves que diminuíram: mutum, jacu, jacutinga, arara.
Florescimento e frutificação de plantas na T.I. Wawi e no P.I.X.	"A flor *akrokairã* dava no mês de junho, aí o rio estava baixo e o peixe comia, agora a água nem abaixou e já está dando flor. A fruta murici do mato dava em agosto, agora aparece no final da chuva (a partir de maio)" (entrevistado 49). "O murici está diferente, dando fruta antes do que ocorria no passado" (entrevistado 316) "Tem algumas frutas que estão dando antes, como murici do mato, dava na época da seca e agora está dando na época da chuva. O api está dando depois, dava na época da seca e agora dá na época da chuva" (entrevistado 119). "A fruta api dava sempre no mês de setembro, agora está tendo no mês de novembro" (entrevistado 61). "O ingá nasce na época certa, o api está caindo antes da época dele. Antigamente dava fruta na chuva, agora dá fruta na época da seca" (entrevistado 303).	Continua igual há 20 anos (71%)	n.a.
		Diminuiu (4%)	• Desmatamento • Incêndios florestais • Natureza está mudando • As plantas estariam florescendo antes da época usual, devido às chuvas que não caem no período esperado
		Aumentou (3%)	• Não souberam dizer.
		Depende (21%)	• Algumas árvores e outras plantas estariam florescendo e dando frutos antes do tempo, por exemplo: murici (*Byrsonima crassifólia (L.) Rich*), caju (*Anacardium occidentale*), mandioca

Mudança observada	Exemplos de relatos das entrevistas	Frequência (%)	Descrição de possíveis causas para as mudanças observadas segundo os entrevistados
	"A fruta api está dando antes do que é para dar" (entrevistado 268). "O pequi quando cai, todas as frutas caem, depois ele floresce de novo, e isso não acontecia antes, pois florescia uma vez só" (entrevistado 308). "As frutas do pequi algumas nascem mais cedo, outros mais tarde" (entrevistado 21). "A mangaba hoje em dia dá o ano todo, antes tinha época certa" (entrevistado 20). "Os pés de inajá e tucum estão diminuindo. A fruta ingá está dando antes do tempo" (entrevistado 141). "O ingá está dando mais cedo" (entrevistado 121). "O ingá está dando mais tarde" (entrevistado 263). "O caju está dando mais cedo" (entrevistado 29). "A fruta do mato que chamamos hwĩsykratxi está dando mais cedo" (entrevistado 107). "A mandioca nasce e já começa a dar flor, antes crescia um pouco mais para depois florescer. O murici do mato quando cai tudo já começa a dar flor, antigamente dava flor no mês de fevereiro, quando o pessoal começa a fazer a roca porque demora três ou quatro meses, hoje não é mais assim. A fruta vermelha api do mato, sempre dava em setembro e novembro, mas agora está dando depois do tempo" (entrevistado 326). "O pequi começava a cair nos meses de outubro e novembro, agora está mais cedo, no mês de agosto já está ficando grande. A flor nasce rápido também" (entrevistado 11). "As queimadas fizeram diminuir os pés de tucum e inajá, e não sei para o ingá" (entrevistado 141		**(***Manihot Esculenta* Crantz). Não houve concordância sobre a época para outras como: api (nome tradicional), pequi (*Caryocar brasiliense* Camb), ingá (*Inga edulis*)

Nota: n.a.=não se aplica.

Além dessas mudanças já descritas, os Khĩsêtjê observaram eventos inusitados ou raros que aconteceram em sua aldeia. Dentre esses, incluem-se eventos climáticos extremos, que podem ter acentuado a percepção daquelas mudanças que são gradativas, por exemplo, a percepção errônea sobre o aumento de chuvas com ventos fortes. Outros estudos com populações que não são de pequena escala retratam que as percepções sobre as MC podem surgir em decorrência das experiências pessoais que as pessoas tiveram com eventos climáticos extremos (HOWE; LEISEROWITZ, 2013; MYERS *et al.*, 2013). Além disso, haveria um viés de percepção que pode ser explicado por conhecimentos das Ciências Comportamentais. Em particular, por cognições denominadas heurísticas ou atalhos mentais, que são regras simples utilizadas para tomar decisões mais rapidamente ou fazer julgamentos em situações repetitivas (GIGERENZER; GAISSMAIER, 2011). Tais heurísticas podem levar a vieses da tomada de decisão racional. Nesse exemplo, o viés de disponibilidade poderia levar a essa observação, pois tendemos a lembrar mais facilmente de eventos climáticos extremos, que ficariam vívidos na memória (KAHNEMAN; TVERSKY, 1972; TVERSKY; KAHNEMAN, 1973). Por conta disso, as pessoas tendem a confiar mais no que está saliente na mente e, portanto, o julgamento sobre as MC se basearia mais fortemente no que ocorreu mais recentemente (WORLD BANK, 2015). Por exemplo, estudo no Zimbábue (África), indicou que a ocorrência de eventos extremos ficou vívida na memória de agricultores de pequena escala. Para eles, a chuva tem diminuído nos últimos anos, prejudicando suas plantações, muito embora os dados meteorológicos mostrassem que isso não aconteceu em grande parte dos últimos dez anos analisados (MOYO *et al.*, 2012). O mesmo aconteceu com agricultores de outro país africano, Quênia, cuja vivência de eventos climáticos extremos com impactos negativos fez com que eles superestimassem a frequência de ocorrência desses eventos. Com isso, deixaram de investir em tecnologias de plantio mais aprimoradas que deveriam permitir incrementos na produção agrícola (RAO *et al.*, 2011).

Quanto aos eventos inusitados ou raros, 79% dos entrevistados apontaram a ocorrência de eventos deste tipo, resultando em oito eventos: chuva forte com raios, chuva com vento forte, vento forte, chuva forte, mudanças no rio, sol muito quente e chuva fora de época. Dentre esses, alguns podem ser considerados eventos climáticos extremos (para descrição detalhada, ver Tabela II.8), com a ocorrência de chuvas e ventos acima do usual. Em geral, os relatos dos Khĩsêtjê se referem ao ano de 2014, quando os entrevistados ainda viviam na aldeia Ngôjhwêrê, onde habitaram até 2016, e os ventos chegaram a derrubar casas. Padrão similar voltou a ocorrer em 2019, já na aldeia

Khĩkatxi (Figuras 9a e 9b). Os Khĩsêtjê relataram sentir medo e se preocupar com as chuvas fortes com raios, chuvas fortes com ventos fortes e ventos fortes com redemoinhos (Figuras 9c e 9d). Há preocupação com a ocorrência de diversos cenários, como a derrubada de casas e plantações, com a possibilidade de as pessoas serem eletrocutadas ou terem contato próximo com os raios. Por conta disso, antigos hábitos como as crianças brincarem na chuva são atualmente realizados com cautela.

Na literatura, tal medo e preocupação com as MC também foram expressos em investigações com outras populações indígenas, ao menos no Nepal (BOM; TIEFENBACHER; BELBASE, 2022; CHAUDHARY *et al.*, 2021), na Índia (MADHANAGOPAL; PATTANAIK, 2020), na Namíbia (INMAN; HOBBS; TSVUURA, 2020) na Malásia (PIMID *et al.*, 2022) e no Canadá (PETRASEK MACDONALD *et al.*, 2013). Alguns estudos retrataram preocupação com os impactos das MC nas atividades de subsistência (BOM; TIEFENBACHER; BELBASE, 2022; PETRASEK MACDONALD *et al.*, 2013), enquanto outros, preocupação com o aumento da frequência e intensidade dos eventos climáticos extremos (MADHANAGOPAL; PATTANAIK, 2020; PIMID *et al.*, 2022), ou com eventos climáticos extremos específicos, como a seca (INMAN; HOBBS; TSVUURA, 2020) ou as chuvas de monção (CHAUDHARY *et al.*, 2021).

Figura II.9 – Desastres ocorridos na aldeia Khĩkatxi em agosto de 2019

(9a) e (9b) Casa derrubada pela chuva e vento fortes.


(9c) e (9d) Tempestade de poeira na aldeia Khĩkatxi.
Fonte: Lia Taruiap Troncarelli, 2019.

Embora os Khĩsêtjê tenham acesso a diferentes fontes de informação, quando indagados, 62% dos entrevistados já tinham ouvido falar sobre as MC através dos seguintes meios: (i) televisão (61%), (ii) internet (acessando o Facebook, Instagram, e-mail ou outros sites (22%)), (iii) lendo revistas ou algum livro na escola (13%) e (iv) ouvindo rádio (4%). Esses relatos condizem com o reportado na literatura, segundo a qual o acesso à informação por meio de rádio, televisão e jornal aumentaria o conhecimento e consciência sobre as MC (HUDA, 2013). Independentemente da localização onde habitam, outros povos indígenas ao redor do mundo também utilizaram ao menos um desses meios para se informarem sobre as MC, como os povos indígenas do Nepal (BOM; TIEFENBACHER; BELBASE, 2022), Bangladesh (AHMED; ATIQUL HAQ, 2019; HUDA, 2013), Camarões (TUME; KIMENGSI; FOGWE, 2019) e Uganda (ORLOVE *et al.*, 2010). Porém, diferente do observado com os Khĩsêtjê, a informação também teria sido obtida através de: (i) pesquisadores que visitavam a comunidade (BOM; TIEFENBACHER; BELBASE, 2022) e (ii) serviços meteorológicos (TUME; KIMENGSI; FOGWE, 2019). Na T.I. Wawi não existem serviços que informariam sobre as condições meteorológicas da região.

Portanto, a percepção que os Khĩsêtjê têm sobre as MC é obtida através de: (i) observação direta de eventos climáticos que acontecem na aldeia e no entorno da T.I., (ii) experiência direta com as atividades de subsistência e com os próprios eventos climáticos, (iii) conhecimento tradicional por meio da observação de indicadores físicos e biológicos e (iv) experiência indireta adquirida de diferentes fontes de informação, mais comumente mídias tradicionais e eletrônicas.

Tabela II.8 - Informações sobre os eventos climáticos inusitados ou raros observados entre os Khĩsêtjê (n=109)

Evento climático observado	Exemplos de relatos dados pelos entrevistados	Frequência (%)
Chuva forte com raios*	*"Chuva com vento e raio, não acontecia antes, a chuva caía normal. Quando começa a chover o raio está mais forte"* *"Chuva e raios estão mais fortes. Quando chove parece que está enchendo tudo, como se fosse um rio"* *"Chuva com raio, vento forte. Uma vez fui pescar e quando vim pra aldeia, vi uma folha de buriti caindo no rio, derrubando todas as folhas, e a parte de cima do teto da casa".* *"Chuva foi feia, com muitos raios, desde 2014 quando chove eu fico com medo"* *"Achei que não ia ver o clima mudando, quando era criança não pensava que ia ver essas coisas no futuro. A chuva nunca veio com raio, e na primeira chuva já veio assim em 2014".* *"Um raio atingiu uma mulher e me deu um choque"* *"Os raios estão mais fortes, me assustei no dia que uma menina tomou um choque".* *"Chuva com raios está mais forte e dá medo"* *"O raio caiu em uma casa no Ngôsokô. Caiu dentro da casa e na escola"* *"A chuva vem forte com raios e vento, derruba a plantação"* *"Estava chovendo e caiu um raio quando estávamos derrubando a roça, foi perto da casa do Karontontxi"* *"A chuva vem forte e com raio, quando era criança eu brincava na chuva, mas hoje em dia não pode, o raio está muito forte"* *"Ano passado a chuva estava feia, com vento forte e bastante raio"* *"A chuva que aconteceu nessa aldeia (atual), quando a gente morava na aldeia velha (Rikô) não acontecia, mas percebo que aqui a chuva com raio está dando mais forte".*	24%
Chuva com vento forte*	*"A chuva está mudando muito, antes não era assim, quando começa o tempo da chuva não tinha muito vento. Agora quando começa a chover tem muito vento, e as nuvens estão diferentes"* *"A chuva mudou, antes vinha leve, ontem veio com muito vento forte. Quando Blairo Maggi[24] assumiu já começamos a perceber que mudou, aumentou o desmatamento, foi aí que começou".* *"Vento e chuva muito fortes, muita poeira formando um redemoinho, o sol está muito quente, não dá pra ficar sem blusa depois das dez horas da manhã".* *"A chuva veio forte com vento, as nuvens ficaram pretas, isso me assustou"* *"A chuva e o vento muito fortes, o vento veio forte derrubando uma casa"* *"Quando a chuva cai, parece que está brava, vem com vento muito forte, acaba estragando alguma planta, derruba as plantas, a mandioca estraga. Ano passado eu vi isso"* *"O vento e a chuva estão mais fortes, quase toda vez que chove vem assim"*	18%

[24] Embora o entrevistado não tenha esclarecido o período, o fazendeiro e político citado ocupou cargos públicos no estado de Mato Grosso entre 2003 e 2016.

Evento climático observado	Exemplos de relatos dados pelos entrevistados	Frequência (%)
Vento forte*	*"O vento está mais forte, nesse ano no começo do ano, em fevereiro, foi tão forte que quebrou as árvores"* *"Com a chuva já levamos susto, com vento muito forte balançando a casa, antes não tinha isso, o vento sempre era normal".* *"Na aldeia Ngôjhwêrê o vento forte derrubou minha casa"* *"Um vento de poeira que forma redemoinho na aldeia Ngôjhwêrê"* *"No temporal o vento está forte. Em 2014 o vento ficou mais forte"* *"O vento está mais forte, mesmo não chovendo"* *"Vento forte, antes não acontecia".* *"Redemoinho de vento, vento forte. Muito forte, muito mesmo"* *"Vento que leva as coisas, antes víamos só quando estávamos no rio, hoje a gente vê muito dentro da aldeia".* *"Vento, onze horas da manhã o vento ficou girando bem forte, fiquei preocupada, porque agora está diferente"* *"Com o vento forte eu fiquei com medo, sempre que venta fico com medo"*	16%
Chuva forte*	"*Chuva muito forte, estava com medo de afundar, porque choveu muito forte, medo de alagar tudo".* *"Chuva mais forte do que antigamente"* *"Chuva vem forte, todas as vezes atualmente"* *"Chuva muito forte que assustou"*	8%
Mudanças no rio (assoreamento, seca* ou cheia extremas*, escassez de peixes)	*"Uma grande seca, ficou muito tempo sem chover. O rio Wawi era clarinho e hoje está vermelho e escuro. O rio totalmente escuro e vermelho sem peixes, antes tinha muito peixe".* *"Nível do rio que seca muito ou enche muito"* *"Observou o rio, que tinha chovido, mas o rio não enchia e não era como era antes. Não chegava o rio no nível que deveria chegar na época da cheia e diminuiu sem chegar".* *"No rio a terra está caindo, a mata era bem fechada antes, mas agora está caindo na beira. Isso no rio Suiá-Miçu"* *"O rio não seca muito, fica sempre no mesmo nível, eu acho que é por causa das barragens que estão construindo pelos rios"* *"O rio não seca muito, antes secava muito"*	6%
Sol quente	*"Está ficando mais quente, mais calor e fico com medo".* *"O sol está mais quente, antigamente não era assim, está esquentando muito quando é nove e dez horas da manhã"* *"O sol está mais forte, mais quente".* *"O sol muito mais quente, chuva está muito forte, não era igual antes"* *"O sol hoje está muito quente"*	5%
Chuva fora de época	*"Não está chovendo na época certa, está mais quente. O rio está secando cada vez mais e a poluição aumentou"* *"A chuva chovia no tempo certo, antes roçava e derrubava no mês de abril e a derrubada era em maio, hoje em junho você está derrubando. A chuva não vem no tempo certo"* *"Mudança do mês que chove, fiquei preocupado, se for assim vai morrer tudo que a gente plantar".*	3%

Nota: Asterisco(*) corresponde a eventos climáticos extremos.

3.5. Percepção sobre as causas das mudanças no clima[25]

Entre os entrevistados que percebiam as MC (91%), fatores humanos foram considerados como principais causas, o que significa que as pessoas seriam responsáveis, ainda que indiretamente, pelo desmatamento, construção de hidrelétricas, criação de gado e queimadas (Figura II.10).

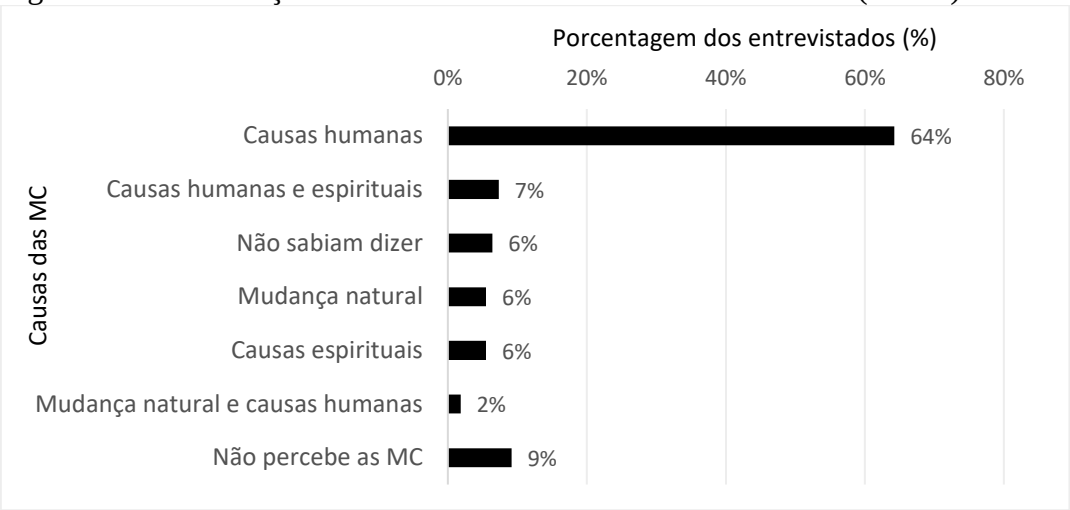
Em outros estudos na Amazônia e ao redor do mundo, causas humanas também foram consideradas importantes por populações de pequena escala. No oeste da Amazônia, o povo indígena Yawanawá, habitante da T.I. do Rio Gregório, estado do Acre, atribuiu como causas das MCs as ações humanas como as queimadas e o desmatamento (NASCIMENTO, 2013). Para as comunidades tradicionais habitantes das Unidades de Conservação na Amazônia brasileira, como a RDS do Rio Iratapuru, RDS Mamirauá, RDS do Tupé, RESEX de Ciriáco, RESEX Chico Mendes, e da T.I. Kayapó (aldeia Mojkarakô), as ações antropogênicas como o desmatamento, a degradação do solo e do meio ambiente, a construção de barragens, a pecuária e a construção de estradas seriam as causas principais das mudanças no clima (FUNATSU *et al.*, 2019). Já em outros locais do mundo, o desmatamento também foi descrito como causador das MC em estudos com indígenas no Zimbábue (KUPIKA *et al.*, 2019), Camarões (CHIMI *et al.*, 2022) e com populações rurais de pequenos agricultores na Etiópia (HUNDERA; MPANDELI; BANTIDER, 2019).

Contrário ao esperado, poucos entrevistados atribuíram a responsabilidade pelas MC a causas espirituais (~6%, n=6). Para 5,5% dos entrevistados (número igual de homens e mulheres, entre 30 e 51 anos), os espíritos donos das florestas estariam bravos com a destruição das florestas provocada pelos seres humanos e, portanto, estariam se vingando ou agindo com raiva através das MCs. Esse resultado foi inesperado, pois diversas sociedades de pequena escala no mundo percebem as MCs baseadas em suas crenças espirituais e, para alguns povos indígenas, o conhecimento sobre o clima estaria relacionado com a cosmologia (SÁNCHEZ-CORTÉS; CHAVERO, 2011). Por exemplo, para os pastoralistas Himba da Namíbia, as MC seriam causadas por Deus (INMAN; HOBBS; TSVUURA, 2020), enquanto para os Tsiname' da Bolívia os espíritos estariam com raiva pela derrubada de muitas árvores (FERNÁNDEZ-LLAMAZARES *et al.*, 2015). Também entre o povo indígena andino Quechua, da Bolívia, as MC seriam respostas zangadas de Pachamama ou de Deus ao comportamento humano inadequado (BOILLAT;

[25] Embora pareça algo único, existem diversos tipos de MC, que podem ter diferentes causas e consequências.

BERKES, 2013). De forma similar, para os Bàkì de Camarões, as MC seriam a punição das deidades por desobediência às normas culturais do grupo (CHIMI *et al.*, 2022).

Figura II.10 – Descrição das causas das MC entre os entrevistados (n=109)



Portanto, o que os Khĩsêtjê identificam como causas das MC advém mais do contexto local/regional do próprio entorno da T.I. (e.g., desmatamento) do que de causas espirituais, como observado em outros países e contextos. Este resultado sugere que o conhecimento dos Khĩsêtjê sobre o que ocorre na T.I. e em suas imediações influencia fortemente a percepção local sobre as MC.

3.6. Preocupações futuras com as atividades de subsistência e saúde

Os Khĩsêtjê demonstraram preocupação com os cenários futuros das MC nas atividades de subsistência e na saúde.

Na agricultura, 80,73% dos Khĩsêtjê demonstraram preocupação com: (i) a época da chuva presente e futura; (ii) em plantarem, mas não nascer qualquer alimento; (iii) em secarem todas as plantações dos roçados devido a altas temperaturas e (iv) em perderem algumas variedades de mandioca, como as variedades caracterizadas por eles como aquela que tem bastante caldo e a utilizada no preparo do mingau denominado no português regional de perereba. Segundo os Khĩsêtjê, os alimentos não deverão nascer como usual, havendo o risco de a comunidade ficar sem ter o que produzir e, com isso, não poder se alimentar com os produtos do roçado. Por exemplo, a mandioca já não estaria crescendo com a mesma qualidade de antigamente, tampouco as

bananeiras. Outras preocupações foram com o fogo nos roçados, que se tornaria mais imprevisível e incontrolável, ou com as nascentes dos rios que se tornariam mais secas. 19,27% dos entrevistados não sabiam dizer se estavam preocupados com os roçados.

Já para outras atividades, 29,35% dos Khĩsêtjê consideraram que as MC estariam tornando os rios mais quentes, com menos água e poluídos, afetando negativamente a pesca, dado o aumento na mortalidade dos peixes. Além disso, a água dos poços e dos rios secaria, enquanto aquela dos rios se tornaria mais quente, inviabilizando o seu consumo. Segundo 7,33% dos entrevistados, para a caça, os animais morreriam por falta de água e de alimentos nas florestas. Para a coleta de produtos da floresta, maior frequência nos incêndios florestais diminuiriam a quantidade de frutos comestíveis nas florestas e as florestas secariam (para 6,42% dos entrevistados). Enquanto 25,68% não souberam dizer. O restante dos entrevistados novamente citou preocupação com o roçado (11%).

Por fim, os Khĩsêtjê (8,25%) percebem também efeitos sobre a saúde das pessoas. Para eles, indivíduos mais velhos ficariam mais vulneráveis às doenças e ao calor.

3.7. Estratégias de adaptação entre os Khĩsêtjê

Ainda é incerto como muitos dos povos indígenas se adaptarão às MC, uma vez que experimentam diferentes tipos de impactos a depender da região em que se encontram. No caso dos Khĩsêtjê, 90% dos entrevistados disseram não se sentirem em condições (preparados) para enfrentar as MC e 60% não tinham ideias do que fazer para se adaptarem.

Mesmo assim, algumas pessoas (3,7%) propuseram como uma solução para a seca no roçado, implementar um sistema de irrigação e buscar alternativas para lidar com a falta de chuvas e a produção de produtos do roçado, conforme os seguintes relatos:

> "Do jeito que está esquentando, eu me preocupo com a nossa mandioca. Nós já temos que pensar na máquina que puxa água da terra ou do rio para jogar na plantação" (entrevistado 49)
>
> "A roça vai dar mais trabalho no futuro, vamos precisar fazer uma irrigação para continuar plantando e vivendo" (entrevistado 332).
>
> "Vamos ter que colocar uma mangueira para molhar a plantação, igual o meu primo na outra aldeia fez. Ele plantou no mês de agosto em 2015 e não choveu. Então, ele teve essa ideia depois dessa seca em 2015. Se não chover no tempo certo, nós vamos ter que fazer isso, ou colocar uma bomba no rio para puxar água do rio para a roça" (entrevistado 11).

Quanto à falta de comida que a seca ocasionaria no roçado, pelo não crescimento das plantações, foi sugerido por dois indivíduos (1,8%) começar a estocar mais polvilho quando a produção de mandioca for maior do que a necessária, possibilitando utilizá-la nos momentos em que não é possível ir ao roçado. Por exemplo:

> "Por causa das mudanças que estamos observando, nós guardamos no saco ou balde o polvilho, e dura muito tempo. Nós preparamos quando temos muita mandioca, pensando que no ano que não vai muito bem e não tem mandioca o suficiente, temos essa comida guardada. Ou quando só chove, e não conseguimos ir na roça, temos polvilho na casa guardado, e não ficamos sem nada" (entrevistado 350).

Quanto ao desmatamento no entorno, 21,10% dos entrevistados sugeriram replantar onde não há mais floresta, árvores frutíferas e não frutíferas dentro e fora da T.I.

Outras soluções propostas referem-se a atuar junto aos moradores do entorno da T.I.. Sugeriu-se por 4,58% dos entrevistados, conscientizar os fazendeiros do entorno da T.I. para que respeitem a floresta, incentivando-os a replantarem as árvores em suas fazendas, principalmente nas cabeceiras dos rios que adentram a T.I. Para conscientizarem pessoas externas à comunidade (e.g., governo), mas também da comunidade, um entrevistado relatou a possibilidade de gravarem vídeos informativos sobre as MC que estariam acontecendo na aldeia para serem divulgados fora da comunidade.

De modo geral, os Khĩsêtjê ressaltaram que propor e implementar estratégias de adaptação não é uma tarefa a ser realizada por um único indivíduo, mas sim entre toda a comunidade Khĩsêtjê, em parceria com as pessoas de fora da comunidade, como o governo e os grandes produtores de soja e milho no entorno.

> "Se os grandes fazendeiros e os grandes produtores entenderem o problema do clima e das cabeceiras, podemos recuperar as florestas. Mas, sozinhos nós indígenas não conseguimos, pois eles que são desmatadores e destruidores. Eles que precisam pensar e respeitar o meio ambiente, e recuperar algumas nascentes dos rios. Com o governo Bolsonaro não temos como pensar em recuperar agora" (entrevistado 326).

Apesar de os Khĩsêtjê não saberem quais estratégias futuras poderão adotar na agricultura e coleta de produtos florestais não madeireiros (PFNM), foi observado pela pesquisadora em campo que eles já mudaram vários aspectos.

Na agricultura, foram observadas várias mudanças (embora não tenham sido relatadas pelos Khĩsêtjê). Primeiro, o horário que visitam o roçado, optando pela ida no período da manhã, desde o nascer do sol até no máximo nove horas da manhã, ou no período da tarde, entre cinco e seis horas. Antes, eles iam no roçado não apenas pela manhã e fim de tarde, mas também em outros horários entre nove da manhã e quatro horas da tarde. Segundo, as vestimentas utilizadas para a prática da agricultura também mudaram; tornou-se mais frequente o uso de casacos ou blusas de manga comprida, chapéus e bonés para proteção do sol. Terceiro, mudaram vários aspectos da prática de queima do roçado. Antigamente, quando queimavam o roçado, o fogo raras vezes se alastrava. Atualmente, contudo, os Khĩsêtjê passaram a fazer aceiros para evitar que isso ocorra. A queimada do roçado também passou a ser realizada apenas no final da tarde, evitando horários em que o sol está mais quente, como o meio do dia. Quarto, alguns indivíduos Khĩsêtjê têm alterado a tomada de decisões sobre o calendário agrícola dos roçados (época de preparação e plantio), em função de mudanças do regime de chuvas. Portanto, os meses de realização da roçada, da derrubada de árvores e do plantio têm sido postergados. Por fim, os Khĩsêtjê participam de treinamentos para combater o fogo pelo Centro Nacional de Prevenção e Combate aos Incêndios Florestais (Prevfogo) do IBAMA (Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis).

Também na coleta de PFNM foram observadas mudanças. Os Khĩsêtjê têm um projeto de recuperação de áreas degradadas através do plantio de árvores de pequi (*Caryocar brasiliense* Camb) em uma parte de seu território reconquistado, que abrigava anteriormente uma fazenda de criação de gado. O projeto denominado "Hwĩn Mbê" é implementado pela AIK e realiza a extração do óleo de pequi como forma de renda monetária para a comunidade. Inclusive, esse projeto foi premiado em 2019 pela Organização das Nações Unidas (ONU) com o prêmio Equatorial (EQUATOR INITIATIVE, 2019).

Vemos, portanto, que as estratégias propostas e implementadas como forma de adaptação às MC abarcam apenas a agricultura e a coleta de produtos da floresta, desconsiderando a caça e pesca. Provavelmente, a diferença existe porque a necessidade de adaptação às MCs afeta especialmente atividades que necessitam de planejamento de longo prazo, enquanto no caso da caça e pesca o planejamento é de curto prazo. Isso é preocupante, pois os Khĩsêtjê podem estar se esquecendo de considerar a manutenção das fontes de proteína em suas estratégias futuras ou, até mesmo, não sabem o que fazer para garantir este componente de sua segurança alimentar.

4. CONCLUSÕES

Este estudo buscou entender a percepção sobre a ocorrência das MC entre os Khĩsêtjê, povo indígena habitante da Amazônia brasileira. Cinco resultados principais foram encontrados. Primeiro, os Khĩsêtjê já percebem os efeitos das MC, como mudanças graduais nas temperaturas, precipitações, frequência de ocorrência de raios e na intensidade de ventos, além do aumento de eventos inusitados que ocorreram na aldeia, relacionados principalmente ao nível de precipitação. Percebem também mudanças na ocorrência e abundância de certas espécies da flora e fauna da região, muito embora neste caso as causas se combinem a outras mudanças no uso dos solos. Segundo, causas humanas foram consideradas responsáveis pelas MC por mais da metade dos entrevistados. Terceiro, mais da metade dos entrevistados tiveram acesso a diferentes fontes de informação sobre as MC. Quarto, os Khĩsêtjê utilizam o conhecimento tradicional, representado por indicadores físicos e biológicos para fazerem previsões de curto prazo (dias/semanas) e, com isso, antever: (i) mudanças nas estações do ano, ou seja, o início e final das épocas de seca e chuva e (ii) o momento em que se iniciarão as chuvas e, portanto, adequado para o plantio de mandioca no roçado. Quinto, algumas estratégias de adaptação têm sido utilizadas pelos entrevistados no caso da agricultura e coleta de produtos da floresta, mas mudanças na caça e pesca e, portanto, acesso a fontes de proteína têm sido desconsideradas. Além disso, os entrevistados não se sentem preparados para lidar com as MC e menos da metade dos entrevistados (~32%) relataram ideias de estratégias de adaptação.

Os resultados levaram a cinco conclusões principais, listadas a seguir.

Primeiro, embora a percepção de MC possa abranger na literatura científica diferentes definições e nomenclaturas (i.e. constructos), no caso dos Khĩsêtjê ela consistiu: (i) na observação direta de eventos climáticos que acontecem na aldeia e no entorno da T.I., (ii) na experiência direta com as atividades de subsistência e com os próprios eventos climáticos, (iii) no conhecimento tradicional por meio da observação de indicadores físicos e biológicos e (iv) na experiência indireta adquirida de diferentes fontes de informação.

Segundo, os contextos local e regional afetaram tanto as mudanças observadas, quanto a percepção dos entrevistados sobre as causas das MC. Compartilhar essa percepção local com outros povos indígenas amazônicos poderia favorecer a troca de conhecimento e experiência em locais em que as previsões climáticas são similares e os impactos já vêm sendo relatados, contribuindo na implementação de estratégias adaptativas.

Terceiro, algumas das mudanças observadas pelos Khĩsêtjê estão de acordo com o previsto para ocorrer na Amazônia, como o aumento da temperatura média e, consequentemente, da sensação de calor. Em nosso estudo, isso significou a percepção local de que "o sol está mais quente". Já outras mudanças, como o aumento das precipitações, apresentado como o aumento de chuvas fortes com ventos fortes, não é previsto para a região onde se encontra a T.I. Wawi. Pelo contrário, os modelos climáticos preveem a diminuição do nível das precipitações nesta localidade. Assim, o que os Khĩsêtjê podem estar percebendo são eventos climáticos extremos, que são mais evidentes em sua memória por conta de vieses cognitivos de percepção (heurística de disponibilidade).

Quarto, sobre as estratégias de adaptação, os Khĩsêtjê estão pensando mais nas atividades agrícola e de coleta de produtos da floresta e menos nas atividades de caça e pesca. Ao menos nas respostas das entrevistas não houveram propostas de adaptação ou mudanças adotadas para essas duas atividades que são as principais fontes de proteína animal. Esse resultado é preocupante, pois as proteínas advindas da caça e da pesca são essenciais para a garantia da segurança alimentar de populações indígenas (BENNETT; ROBINSON, 2000). Portanto, é necessário e urgente que futuras estratégias de adaptação sejam idealizadas considerando todas as atividades de subsistência.

Por fim, é provável que muitos dos indicadores tradicionais biológicos e físicos se tornarão imprevisíveis com as MC, deixando de antecipar o que antes conseguiam prever. Com isso, podem se tornar ferramentas mal adaptadas à tomada de decisão em atividades de subsistência, por exemplo, para fazerem previsões sobre o início das chuvas e o melhor período de começar o plantio da mandioca ou outros alimentos no roçado. Portanto, um possível caminho seja conciliar métodos de previsão científicos com aqueles tradicionais.

Relembra-se que como limitação dos resultados deste capítulo, houve durante a pesquisa a pandemia Covid-19 que impossibilitou o retorno para a comunidade visando complementar a coleta de dados. Portanto, as entrevistas ocorreram em um único momento no tempo antes da pandemia Covid-19. Reconhece-se que outras informações e observações poderiam ter surgido de novas coletas de dados na comunidade, possivelmente alterando ou complementando os resultados já obtidos.

Espera-se que este estudo contribua com informações para os tomadores de decisão e partes interessadas em MC (e.g., governo, sociedade, pesquisadores, outras comunidades indígenas) sobre a importância de compreender a percepção que diferentes povos indígenas têm sobre as MC, uma

vez que populações de pequena escala serão fortemente impactadas por elas. Os resultados mostraram que existem várias equivalências com estudos de outras sociedades da própria Amazônia, mas também de outras partes do mundo, como a África e Ásia. Por outro lado, há também diferenças dentre comunidades da própria Amazônia, pois seriam esperadas mudanças entre oeste e leste da Amazônia, dado que no leste ficaria mais seco do que o oeste, enquanto a oeste seria esperado que chovesse mais.

Sugere-se que trabalhos futuros expandam as pesquisas com outras populações tradicionais de pequena escala na Amazônia, procurando entender se o mesmo padrão de percepção se repete quando comparadas regiões onde alterações climáticas diferentes são previstas (e.g., leste e oeste) e com grupos humanos culturalmente diferenciados. Sobre os Khĩsêtjê e outros povos indígenas do T.I.X. e de outras regiões no Brasil, seria importante investigar quais estratégias de adaptação são ou poderiam ser adotadas para fazer frente aos impactos negativos em todas as atividades ao invés de somente na agricultura.

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6. APÊNDICES[26]

Apêndice A – Calendário sazonal.

Apêndice B - Protocolo das entrevistas estruturadas.

Apêndice C –Autorização FUNAI

Apêndice D – Autorização CONEP/CEP

[26] Os apêndices constam ao final da tese.

CONSIDERAÇÕES FINAIS

As mudanças climáticas (MC) já afetam as populações de pequena escala globalmente (COHN *et al.*, 2017; IPCC, 2018; KRONIK; VERNER, 2010) e diversos estudos retratam a percepção que essas populações têm sobre as MC (FIERROS-GONZÁLEZ; LÓPEZ-FELDMAN, 2021; MADHURI; SHARMA, 2020). Porém, essa literatura varia no conceito de percepção adotado, assim como em sua forma de apresentação, com autores que o definem explicitamente (e.g., BAUER; DE JONG; INGRAM, 2022; BAUL et al., 2022; PIMID et al., 2022; TORRES et al., 2022) e outros que apresentam implicitamente o conceito (e.g., CHANZA; MUSAKWA, 2022; CHIMI et al., 2022; MIARA et al., 2022; MURINGAI; MAFONGOYA; LOTTERING, 2022). De fato, por meio do mapeamento apresentado no Capítulo I, esta tese mostrou que, na literatura de MC dos últimos cinco anos, o conceito de percepção em populações de pequena escala foi definido mais frequentemente de maneira implícita do que explícita, o que dificulta compreender e comparar os resultados das diferentes investigações. Assim, a forma adotada nesta tese para analisar o conceito de percepção foi através do uso de constructos, ou seja, "uma ideia ou conceito complexo formado a partir de uma síntese de ideias mais simples"(APA, 2007). Sendo assim, independente dos estudos apresentarem definições explícitas ou implícitas, foram identificados constructos diversos por meio do sentido adotado pelos autores nos artigos. Dentre os onze constructos identificados no total dos artigos avaliados, aqueles mais utilizados foram a exposição direta às MC, a percepção das MC através de estímulos sensoriais, a consciência e as crenças sobre tais mudanças.

Portanto, esta tese mostrou que o conceito de percepção tem sido tratado de forma interdisciplinar na literatura de MC. A mesma observação foi confirmada por dados empíricos primários no Capítulo II, por meio da investigação com uma população indígena habitante da Amazônia. Por um lado, essa interdisciplinaridade na literatura de MC favorece o diálogo entre diferentes disciplinas (e.g., Psicologia, Antropologia, Ciências Ambientais, Economia, dentre outras) e entre pesquisadores com formações diversas. Porém, a ausência de clareza conceitual dificulta que seja acumulado conhecimento teórico, por meio de comparações entre os resultados de estudos que adotaram conceitos equivalentes. Por exemplo, para entender quais são as diferentes formas (conceitos) de percepção das MC, ou então suas consequências.

O mapeamento no Capítulo I mostrou que houve crescimento no número de estudos nos anos de 2021 e 2022, o que provavelmente indica o aumento do interesse de pesquisadores em compreender como as populações de pequena escala percebem as MC. Um dos benefícios desse aumento para a ciência é a complementação de dados onde não há informações meteorológicas pela ausência/ineficiência de estações de medição (SAVO *et al.*, 2016). Além disso, estudos no tema permitem maior integração do conhecimento tradicional àquele científico (REYES-GARCÍA *et al.*, 2016; SAVO *et al.*, 2016), reconhecendo o conhecimento tradicional como uma forma legítima de conhecimento (MATSUI, 2015).

Quanto às teorias abordadas nos artigos revisados no Capítulo I, esperava-se que mais estudos fossem direcionados por teorias que embasassem e explicassem diferentes formas de percepção. Em contraste, apenas 12% dos artigos apontaram explicitamente uma teoria ou *framework* ao longo do artigo e, além disso, mesmo naqueles que apontaram, a teoria não necessariamente se referia ao conceito de percepção. A maior parte das teorias utilizadas eram de temáticas da Psicologia (principalmente referentes aos vieses cognitivos) e Economia (e.g., Teoria da Utilidade Esperada). Ainda, grande parte daqueles artigos que utilizaram alguma teoria não foram guiados por ela para avaliar ou discutir os resultados. Inclusive, em alguns artigos as teorias foram citadas pontualmente, por exemplo, apenas na seção de métodos (GUODAAR; BARDSLEY; SUH, 2021b, 2021a; MUGAMBIWA; RUKEMA, 2020; SHARMA; JAGTAP; RAO, 2022). Portanto, conclui-se que a literatura de percepção das MC não é, até o momento, embasada teoricamente. Geralmente, os estudos são somente fundamentados na descrição de evidências empíricas, o que dificulta generalizações.

Os resultados do mapeamento também indicaram uma pluralidade de áreas temáticas abordadas nesses artigos. Essa base de evidências sistematizada nesta tese permite aos pesquisadores identificarem quais tópicos de pesquisa necessitam de mais estudos científicos em populações de pequena escala. Por exemplo, mostra que populações não indígenas foram mais estudadas do que as indígenas, e que grande parte dos estudos publicados foram realizados com populações da África e Ásia. Sobre o Brasil, embora o país tenha sido um dos países mais estudados da América do Sul, o número de artigos retratados foi baixo (n=8, ~2% do total de artigos) comparado a outros países do continente africano e asiático. Esperava-se encontrar mais estudos na América do Sul, principalmente pelo alto número de povos indígenas existentes no Brasil, Bolívia e Peru (IWGIA, 2022).

Portanto, o Capítulo I ressaltou a necessidade de mais estudos sobre a percepção das MC por populações de pequena escala na América Latina. Por meio do Capítulo II, esta tese procurou contribuir a essa lacuna do conhecimento, especificamente avaliando um povo indígena habitante da Amazônia, os Khĩsêtjê. Neste capítulo, os resultados apontam que, similar a outras populações do mundo, os Khĩsêtjê percebem mudanças graduais em alguns indicadores climáticos relacionados ao contexto regional onde habitam. Algumas percepções são, provavelmente, decorrentes de experiências prévias com eventos climáticos extremos. Sendo assim, este resultado corrobora evidências prévias de estudos com foco tanto em populações de pequena escala, como outros tipos de populações que demonstraram que as experiências pessoais com eventos climáticos extremos influenciam fortemente a percepção (HOWE; LEISEROWITZ, 2013; MYERS *et al.*, 2013). Em particular, vieses cognitivos, como a heurística de disponibilidade, podem ser a explicação para o surgimento de percepções equivocadas das MC (FOGUESATTO *et al.*, 2020; KANNAN; BESSETTE; ABIDOYE, 2022; WALDMAN *et al.*, 2019). Nossos resultados também mostraram que os Khĩsêtjê percebem as MC através: (i) da observação direta de indicadores físicos e biológicos, ou de eventos climáticos; (ii) da experiência direta com as atividades de subsistência e com os eventos climáticos; (iii) influenciados pelo conhecimento tradicional; (iv) e da experiência indireta adquirida de diferentes fontes de informação. Populações indígenas de diversos locais do mundo também perceberam as MC de formas similares, como no Nepal (BOM; TIEFENBACHER; BELBASE, 2022), Malásia (PIMID *et al.*, 2022), Vietnã (KIEU *et al.*, 2020; MANH; AHMAD, 2021), Bangladesh (AHMED; ATIQUL HAQ, 2019), Camarões (TUME; KIMENGSI; FOGWE, 2019) e Moçambique (SALITE, 2019).

O uso pelos Khĩsêtjê de conhecimento tradicional, por meio de indicadores, para previsões de curto prazo (dias/semanas) permitiu que eles antevissem mudanças nas estações do ano e o momento adequado para o plantio de mandioca no roçado. Contudo, os resultados aqui apresentados têm duas implicações principais. Primeiro, o conhecimento tradicional pode estar adaptado a uma condição que não é aquela atual (SON; CHI; KINGSBURY, 2019). Segundo, dadas as MC, esses indicadores devem ser utilizados com cautela pelas populações de pequena escala e por tomadores de decisão. Isso porque alguns indicadores deixarão de ser confiáveis para previsões (GUIDO *et al.*, 2021; GWENZI *et al.*, 2016), tornando difícil antever qual é o momento propício para realizar certas atividades de subsistência. No caso dos Khĩsêtjê, torna-se mais difícil

decidir qual é o melhor momento de iniciar o plantio no roçado, pois as chuvas tornaram-se mais imprevisíveis e erráticas com as MC.

Os resultados também indicaram que os Khĩsêtjê não têm pensado em estratégias de adaptação voltadas a atividades de subsistência que exigem menos planejamento, como a caça e a pesca. Apesar da importância dessas atividades para a segurança alimentar, os efeitos são desconhecidos, dado que a literatura sobre MC também não contém evidências quanto ao tema em outras localidades. Isso pode indicar tanto negligência dos pesquisadores quanto ao tema, como a negligência por parte das comunidades como aqui relatado.

Concluindo, esta tese demonstrou que o aprofundamento sobre o que é o conceito de percepção é necessário tanto para avanços teóricos, como para lidar com potenciais problemas práticos das MC sobre populações de pequena escala. Há ao menos cinco razões para tal.

A primeira razão é que a ausência de clareza conceitual pode ocasionar uma avaliação incompleta das diferentes formas de "percepção" pelos pesquisadores, desconsiderando constructos que seriam importantes. Por exemplo, isso poderia ocorrer se o conceito de percepção for tratado apenas como observação direta, desconsiderando outras formas possíveis como as crenças, o conhecimento tradicional, as informações externas recebidas pela população investigada, dentre outros. Além disso, pode haver divergência entre o que os pesquisadores e as comunidades de pequena escala entendem como percepção, dificultando a participação efetiva dessas comunidades tanto nas pesquisas, como na implementação de estratégias de adaptação.

Como segunda razão, a ausência de aprofundamento sobre o que é o conceito pode levar a conclusões equivocadas sobre como são percebidas as MC pelas populações de pequena escala. Por exemplo, a população pode compreender as MC como observação direta de desastres naturais que acontecem no momento atual, sem considerar efeitos de longo prazo, como as alterações na temperatura ocorridas durante décadas ou as mudanças ocorridas nas atividades de subsistência. Além do mais, a não definição do conceito dificulta que aquilo que as comunidades percebem como problemas alcancem de fato as agendas públicas de debate sobre os problemas associados às MC.

Terceira, sem definições adequadas de percepção, é muito difícil que populações de pequena escala, pesquisadores e outras partes interessadas apliquem estratégias de adaptação adequadas a longo prazo. Isso porque a percepção é o primeiro passo para adoção dessas estratégias, e precisa de uma tradução em políticas ou em ferramentas adequadas para lidar com as

mudanças. Uma vez que, ao longo do tempo, as MC devem gerar novos impactos, a não percepção do fenômeno torna difícil a adequação da adaptação às novas condições climáticas.

A quarta razão é que quando a percepção sobre as MC é medida através do conhecimento tradicional, particularmente por indicadores climáticos tradicionais, a funcionalidade pode ser perdida. Tanto as comunidades, como outras partes interessadas (e.g., pesquisadores e governo) precisam se atentar para a potencial perda de eficácia no uso desses indicadores em estratégias de adaptação. Dada a imprevisibilidade das MC, os indicadores podem perder sua funcionalidade e eficácia, deixando de serem métodos de previsão eficientes.

Por fim, conhecer a percepção de populações de pequena escala auxilia os pesquisadores a entender quais são as prioridades e preocupações climáticas dessas comunidades, integrando o conhecimento local ao conhecimento científico, garantindo uma maior funcionalidade de estratégias de adaptação adequadas ao contexto e às necessidades dessas populações.

Este estudo também identificou algumas questões que necessitam de maior compreensão e pesquisas futuras. Primeiro, avaliar se as formas alternativas de definir a percepção (i.e., os constructos adotados) adotadas nesta tese foram suficientes para retratar como o conceito é adotado na literatura, ou haveria outras formas negligenciadas. Segundo, investigar a percepção das MC em outras comunidades de pequena escala similares, procurando avaliar se o contexto local, como de desmatamento e outros usos do solo, realmente determina fortemente a percepção das MC ou se este foi um resultado peculiar aos Khĩsêtjê. Além disso, investigar quais estratégias de adaptação os povos indígenas amazônicos já estariam implementando, ou poderiam vir a implementar, principalmente para as atividades que estão sendo negligenciadas nos planejamentos, como a caça e a pesca. Finalmente, como a maior parte das Terras Indígenas do Brasil se concentra na Amazônia (ISA, 2021), e como a Amazônia será grandemente afetada pelos efeitos das MC (NOBRE *et al.*, 2016), sugerimos que mais estudos sejam realizados avaliando a percepção de populações de pequena escala na região.

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APÊNDICES

Os apêndices são apresentados na seguinte ordem:

CAPÍTULO I

Apêndice A – Protocolo publicado em *Environmental Evidence Journal.*

Apêndice B - Protocolo *Reporting standards for Systematic Evidence (ROSES).*

Apêndice C - *Codebook*

Apêndice D - Processo de elaboração da *string.*

Apêndice E - Lista teste com as 95 publicações de referência

Apêndice F - Lista completa de referências dos artigos selecionados para leitura na íntegra.

Apêndice G - Lista completa dos artigos excluídos na etapa de filtragem por título e resumo, juntamente com os motivos da exclusão.

Apêndice H – Lista das definições explícitas de percepção (na íntegra).

Apêndice I – Lista completa da descrição de como a percepção aparece nos resultados.

CAPÍTULO II:

Apêndice A – Calendário sazonal.

Apêndice B - Protocolo das entrevistas estruturadas.

Apêndice C –Autorização FUNAI

Apêndice D – Autorização CONEP/CEP

APÊNDICES – CAPÍTULO I

Apêndice A – Protocolo publicado em *Environmental Evidence Journal.*

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Environmental Evidence

SYSTEMATIC MAP PROTOCOL

Open Access

What evidence exists on conceptual differences in climate change perceptions of smallholders? A systematic map protocol

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Abstract

Background: Climate change is affecting small-scale populations worldwide. Evidence of adverse effects has been reported for smallholders' agriculture, hunting, fishing, and gathering products from natural ecosystems (non-timber forest products). To take precautions or deal with such problems (i.e. to adapt), smallholders need to perceive climatic changes. Acknowledging this need, the literature on this topic is vast. Despite that, authors adopt alternative concepts of climate change perception, which may hinder comparisons of results across studies. Hence, the review team aim to systematically map the literature usage of the climate change perception concept.

Methods: This systematic map will follow the CEE guidelines and conform to the Reporting Standards for Systematic Evidence form. The review team will rely on five electronic databases of scientific publications—Scopus, Web of Science Core Collection, BASE—Bielefeld Academic Search Engine, Science Direct Elsevier and PubMed—with pre-tested search terms only in English. Publications will be filtered through the "articles only" and "English language" selections. Titles, abstracts, and full texts will then be screened using pre-defined eligibility criteria, including small-scale and indigenous populations inhabiting rural areas, as well as presenting explicitly or implicitly the concept of climate change perception. From articles meeting the eligibility criteria, the review team will extract and encode the data while selecting the full texts for reading. The review team will use a codebook pre-elaborated for encoding. No critical appraisal of study validity will be undertaken. Finally, a database with coded metadata of all studies in the map will be made available. The review team will present the evidence in a report map with text, figures, and tables, besides a catalogue of all identified perception definitions.

Keywords: Climate change awareness, Climate change communication, Climatic variability, Global warming, Indigenous people, Public perception, Smallholders, Small-scale societies, Risk perception

Background

Climate change already affects all world regions, as human activities have caused the warming of soils, oceans, and the atmosphere in the last two thousand years. Alongside temperature increases, since the 1950s, the probability of extreme events such as heatwaves, intense drought, heavy rainfalls, floods, and tropical cyclones has risen [1]. For the future, the Intergovernmental Panel on Climate Change (IPCC) predicts that global warming will inevitably exceed from 1.5 to 2 °C during the twenty-first century unless carbon dioxide and other greenhouse gas emissions are significantly reduced in the coming decades [1, 2]. Climatic changes pose risks to health, economic activities, food security, water supply and threaten the human livelihoods, particularly vulnerable populations living in developing countries [1].

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Foremost, global warming is expected to menace rural people, especially indigenous peoples and other smallholders who directly depend upon natural resources for their livelihoods [3].

Climate change already negatively impacts the livelihoods of small-scale populations [4]. To illustrate, among small-scale agriculturalists, higher temperatures and lower rainfall have increased agricultural crop pests in Bolivia [5], and have changed planting schedule in Bangladesh [6]. In the Peruvian Amazon, more intense floods reduced wildlife populations and, consequently, wild meat consumed by indigenous people [7]. Among indigenous hunters, ice retreat in Alaska impaired cultural practices associated with subsistence, threatening food security [8]. For indigenous people in the Canadian Arctic, climate unpredictability and thinner unstable ice have reduced wild meat and fish consumption, lowering nutrient intake [9]. In the western Himalayas, changes in temperature have diminished the availability of non-timber forest products (NTFPs) among small-scale horticulturalists [10]. Although the current scenario is problematic, when smallholders perceive climatic changes, they may mitigate their negative impacts. Indeed, smallholders' long-term connection and continuous interactions with natural environments, besides their traditional knowledge, may help them detect, understand, and face environmental changes [11].

Smallholders can take precautions or deal with climate change problems through adaptation strategies. Adaptation refers to people's responses to expected or in progress impacts, which individuals implement, private companies, or governments to contain, avoid damage, or even take advantage of potential benefits [12]. Adopting such strategies necessarily begins with the affected population's perception of ongoing climatic changes [13, 14]. Only by being aware of those affected can they assess whether they can respond to the observed changes by adopting any adaptation strategy if and when necessary [15]. Furthermore, investigating people's perceptions is important. This contributes to identifying impacts or changes neglected in the scientific literature, a feature important in places where meteorological data are nonexistent or inadequate [16].

In summary, investigating if, when, and how small-scale populations perceive climate change is essential, and scientists have responded accordingly with a profusion of studies on the topic. Despite that, several studies on this topic do not adopt an explicit or at least a clear definition of perception (e.g. [17–23]).

Formally, the definition of perception originates in Psychology, particularly in Cognitive Psychology [24, 25], which investigates mental processes. In this discipline, people's perception is usually defined as the set processes by which an individual recognises, organises, and makes sense of the sensations he/she receives from environmental stimuli [25]. Although the term may have different meanings even within Psychology, a common element in most perception concepts is that it involves the analysis of sensory information. Thus, when cognitive psychologists talk about perceptions, they usually refer to the basic cognitive processes involved in analysing information received from people's senses [26].

In contrast, in the rare studies on climate change perception that do provide a definition (e.g. [27–32]), conceptualisations of people's perceptions are diverse and encompass not only sensory perceptions [6, 28, 31, 33, 34], but also people's subjective interpretations [35], knowledge [32], awareness and comprehension of the environment [27, 36], beliefs about ongoing changes [29, 32], experiences towards climate variability [32], as well as concern and affect to it [37].

Due to this diversity of definitions about climate change perception, comparisons and syntheses of the scientific literature are hindered for at least three reasons. First, various thematic areas address the concept of climate change perception but are not restricted to it. For instance, the concept is incorporated in studies about traditional/local knowledge [20, 38] or its comparison with actual meteorological data [35, 39], adaptation strategies [14], cognitive biases [18], and perception drivers [40]. Second, studies diverge on the sample units adopted to investigate perceptions, ranging from individuals, households, and communities. Third, studies rely on different methods of investigation (qualitative, quantitative or mixed) [41], with implications for how the results can be interpreted and the concept of perception defined.

Thus, this article provides a systematic mapping protocol for synthesising information on the alternative definitions of climate change perception. Understanding how climate change perception has been conceptualised may contribute to standardising term usage across this subject literature. If so, information syntheses and comparisons would be more reliable, which are essential in this subject area to devise adaptation policies, particularly in smallholder societies' contexts.

The objective of the review

This systematic map aims to identify, classify, and describe the available evidence on the various underlying concepts adopted by the scientific literature to refer to climate change perceptions. The review team (hereafter, team) will focus on the literature addressing small-scale rural populations, including those of indigenous origin, because they directly depend on natural resources. Thus, these groups are more likely to suffer from the adverse effects of climate change [3] and benefit from climate

change perceptions to adapt their subsistence practices. Results from this review may contribute to advance research and practice related to climate change. Although the scientific literature abounds with statements attesting to the importance of people's perceptions to climate change adaptation, studies use the same term with various meanings. Therefore, it hinders the organisation and comparison of the current empirical literature to (i) evaluate which forms of perception are essential to adaptation, and (ii) to identify critical knowledge gaps where future evaluations and syntheses are needed. Improved knowledge about the role of people's perceptions of climate change according to specific definitions may also contribute to better policies aimed at increasing small-scale populations' adaptation.

The primary research question of this study is, therefore:

> *"What evidence exists on the alternative definitions of climate change perceptions adopted in the literature about small-scale populations?"*

The secondary research questions are as follows:

> *"How do the definitions of climate change perception vary and are interpreted across articles, according to their thematic areas, populations of interest, and geographical origin?*
> *What constructs differentiate one definition from another? Are there similarities?"*

The components of the primary question are:

> *Population (P): Small populations living in rural areas, which consist of individuals who produce their resources for livelihood through family labour, with little or no ability to generate surplus production for the market [42].*
> *Exposure (E): Climate change will be considered as exposure.*
> *Outcome (O): Climate change perception definitions.*

Methods

This systematic mapping will: (i) follow the Collaboration for Environmental Evidence guidelines (CEE) [43] and (ii) conform to the Reporting Standards for Systematic Evidence (ROSES) form (Additional file 1) [44]. Systematic mapping is a transparent, rigorous, and objective review technique (i.e. follows a well-defined protocol), which helps to reduce biases inherent to traditional narrative reviews [44, 45]. The mapping technique consists of cataloguing, collating, and describing the existing literature on a particular yet broad topic [45, 46]. In our case, the team will identify and classify the various concepts adopted to refer to smallholders' perceptions about climate change. The team will them describe how the literature conceptualises perceptions and whether this varies according to: (i) regional differences across the geographical space; (ii) subsistence strategy; (iii) description of phenomenon observed (physical phenomenon, biological phenomenon, human phenomenon). Unlike systematic reviews, assessment of evidence quality is optional in systematic mapping. As we will aimed to identify the various forms, correct or incorrect, adopted to refer to climate change perceptions, quality assessment was inappropriate. Hence, no quality assessment will be incorporated. The final database will be a metadata of studies describing bibliographic information, study area, origin and subsistence strategies of the investigated populations, thematic areas addressed in the articles, different definitions of climate change perceptions, constructs that are part of these definitions, the phenomena observed in these articles (physical, biological, human), information about sampling unit, data and methods.

Systematic mapping is appropriate for open-framed questions, such as ours. It is also more appropriate than systematic reviews when the studies to be collated are highly heterogeneous and were generated by different methodologies, such as a mixture of qualitative and quantitative research [45]. The evidence gathered from this approach may be used for developing conceptualisations on a specific topic, in our case, the perception of climate change.

Searching for articles

The systematic mapping will rely on searches in five electronic scientific databases of scientific publications, namely "Scopus", "Web of Science Core Collection" (WoS), "BASE—Bielefeld Academic Search Engine", "Science Direct Elsevier" and "PubMed". The team have chosen these databases because they are comprehensive, multidisciplinary, and peer-reviewed. They also encompass most of the publications on the Environmental Sciences domain that pertain to climate change perceptions. Additionally, the five selected databases implemented processes to guarantee publication quality. In WoS, there is a curation process by specialised and in-house expert editors who deal with a specific subject category. These editors have no affiliation with any publisher house or research institute to avoid biases. To be included in the WoS database, journals are evaluated with a set of 28 criteria [24 quality criteria and four impact criteria] [47]. Similarly, Scopus relies on an independent and international group of scientists and researchers with experience in journal editing to assess journal quality. These researchers are experts in their respective fields and, altogether, form the Scopus Content Selection and Advisory Board (CSAB) [48]. BASE provides over 240 million

documents from over 8000 sources, with 60% of indexed documents open access. BASE indexes documents and journals that meet specific requirements for quality and academic relevance by qualified personnel from the Bielefeld University Library, in Germany [49]. Science Direct Elsevier database contains more than 2200 journals in topics addressing our planet's climate emergency and journals area guides by eminent editorial boards [50]. PubMed is a free resource of the U.S. National Institutes of Health (NIH) of journals in the fields of biomedicine and life sciences and contains over 34 million citations and abstracts of biomedical literature [51]. Although the choice of five databases encompasses a broad range of the literature in the Environmental Sciences, it will certainly leave out many publications. However, as this review aims to qualitatively understand the conceptual usage of terms referring to climate change perceptions, the search strategy is considered adequate. Additionally, including databases focused only on region-specific bibliographic sources would likely bias the findings to those languages the team are able to review, possibly giving a wrong impression of regional differences.

Search terms and language

The search string of our review, i.e. the combination of key terms using Boolean operators (AND, OR), will include English words encompassing three groups of concepts: (i) perception or awareness; (ii) climate change or global warming; and (iii) smallholders (including indigenous population). The team will use special characters (i.e. asterisk) in the search to include alternative forms of word endings and plurals, except for BASE, Science Direct and PubMed because they do not accept asterisk. For details on the string elaboration process, see Additional file 2.

The team will review documents in English because: (i) the review team is familiar with this language and (ii) English is the universal scientific idiom. Although other languages will be excluded, the team does not believe this will bias results for three reasons. First, team intend to identify and describe the various concepts in usage and not compute every single article that used the term. Second, our pre-tests did not indicate geographical distribution in concept usage. Third, there is no direct translation of a few perception terms (e.g., attitudes, awareness) across languages and, therefore, including other languages would add inconsistencies in the coding process. Despite limiting the available evidence, this choice guarantees access to worldwide research as it reduces the selection bias that would result from choosing a small number of languages. Additionally, and more importantly, as this article aims to systematise and analyse the article's alternative usage of the term perception, language differences would probably pose insurmountable challenges to our review, especially when definitions are implicit.

In five databases, the team will search studies with the selected terms appearing in the article's title, abstract or keywords. The team will include common synonyms in the search terms selection (Table 1).

The final search string is described below in the Scopus, WoS, BASE—Bielefeld Academic Search Engine, Science Direct Elsevier and PubMed formats:

Scopus: (TITLE-ABS-KEY ((("perception" OR "local perspective*" OR "awareness") AND ("climat* chang*" OR "global warming" OR "chang* climat*" OR "climat* variabilit*" OR "climat* event*") AND ("indigenous*" OR "smallholder*" OR "small scale*" OR "livelihood*" OR "fisher*" OR "peasant*" OR "hunter*" OR "agricultur*" OR "forager*" OR "agropastoralist*" OR "horticultur*" OR "pastoralist*" OR "herder*" OR "small-island*"))))*
WoS: ALL FIELDS (("perception" OR "local perspective*" OR "awareness") AND ("climat* chang*" OR "global warming" OR "chang* climat*" OR "climat* variabilit*" OR "climat* event*") AND ("indigenous*" OR "smallholder*" OR "small scale*" OR "livelihood*" OR "fisher*" OR "peasant*" OR "hunter*" OR "agricultur*" OR "forager*" OR "agropastoralist*" OR "horticultur*" OR "pastoralist*" OR "herder*" OR "small-island*"))*
BASE: Entire document: ("perception" OR "awareness") AND ("climate change" OR "global warming")

Table 1 Central terms and their synonyms, including in the string

Central terms	Synonyms included in the string	Synonyms without effect in string
Perception	perception*; local perspective*	"climate change perception"
Awareness	–	–
Climate change	climat* chang*; global warming; chang* climat*; climat* variability*; climat* event*	–
Small-scale population	indigenous; smallholder*; small scale*; livelihood*; fisher*; "peasant*"; "hunter*"; "agricultur*"; "forager*"; "agropastoralist*"; "horticultur*"; "pastoralist*"; "herder*"; "small-island*"	"indigenous group"; "hunter-gather"

The use of hyphens or not on "small scale" and "small-island" has no effect on the search. The use of asterisk includes the alternative forms of word endings and plurals

AND ("indigenous" OR "smallholder" OR "small-island")
Science Direct: Title, abstract, keywords: (("perception" OR "awareness") AND ("climate change" OR "global warming") AND ("indigenous" OR "smallholder" OR "small-island"))
PubMed: (("perception" OR "awareness") AND ("climate change" OR "global warming") AND ("indigenous" OR "smallholder" OR "small-island"))

Estimating the comprehensiveness of the search

The comprehensiveness of the search string was tested by comparing the search result with a test list of 95 benchmark publications about climate change perception in small-scale populations. This list originated from the review team's experience with the literature on the subject, which included a previous non-systematic review. With this list, the team evaluated the percentage of articles in the Scopus, Web of Science Core Collection and BASE bibliographic databases (listed in Additional file 3). The team replaced a few terms in the string, such as: (i) removing the term "perceive*"; (ii) replacing "hunt*" with "hunter*"; (iii) replacing AND with OR; (iv) adding "small-island*", resulting in the final string above. The final search string found 94 articles (99%) across the three databases, and we concluded that the comprehensiveness of the search strategy is sufficient.

Publication databases searches

We will access the five databases (Scopus, WoS Core Collection, BASE—Bielefeld Academic Search Engine, Science Direct Elsevier and PubMed) through the institutional subscription via Virtual Private Network (VPN) of the University of São Paulo in Brazil. The following two filters will be applied to the search fields in Scopus and WoS: (i) article in document type and (ii) English in language. In BASE, the team will select basic search, filtering by English in language and article contribution in document type. In Science Direct, we will select advanced search, filtering by title, abstract or author-specified keywords, and we will enter the string. In PubMed no filter will be applied. Our selection will be restricted to articles that report findings from primary data because, otherwise, they could be articles that mixed up different concepts from the original literature. The team will exclude books and book chapters because we cannot guarantee access to them. Therefore, the team will exclude the following article types from the search: (i) documents in languages other than English; (ii) review articles, books, book chapters, conference papers, proceedings papers, conference reviews, editorials, letters and data papers.

Before proceeding to the screening phase, duplicate articles from the five databases (Scopus, WoS, BASE—Bielefeld Academic Search Engine, Science Direct Elsevier and PubMed) will be identified and removed using the Excel spreadsheet. If an article was authored by someone from the review team, this person will not participate in coding decisions.

This review will not pursue additional efforts to obtain literature, such as consultation with experts or stakeholders.

Article screening and study eligibility criteria

Screening process

Two successive screening stages will be followed to assess articles' eligibility, i.e. evaluating its: (1) title and abstract, and (2) full text. Two reviewers will independently screen the title, abstract and full text, and the evaluation results will be compared. A calibration exercise will be employed for consistency checking. Articles that meet the eligibility criteria in the title and abstract will be further screened at stage two, whereas those that did not meet the inclusion criteria will be excluded at this stage. Stage two will consist of full reading papers that met the eligibility criteria in the first screening stage; otherwise, they will be excluded. At both stages, the review team will discuss in weekly meetings the discrepancies in evaluation. When disagreement persists after this meeting, the decision to include or not each article will rely on the tie-breaking vote of a third reviewer. Papers duplicated will be removed. The team will report the reasons for excluding each article in an additional file, as well as the complete record of all articles. Papers with only title and without abstract will be read in full to verify if they will be selected or not for stage two. The team will report the number of articles selected, excluded, and duplicated in each stage (stages 1 and 2) in the ROSES flow diagram [52]. The search results from each database will be exported in an Excel spreadsheet.

To ensure consistency and accuracy of inclusion/exclusion decisions throughout the screening process, two reviewers will check the process consistency through the random selection of 5% or 20 of the total sample of articles (whichever is the greater) for screening (i) title and abstract, and (ii) full text. With that sample, the team will calculate the agreement rate between reviewers regarding the list of articles that fulfilled the criteria for inclusion in stages 1 and 2. The results of the consistency checking will then be compared among reviewers, and all disagreements will be discussed in detail until the consistency level reaches at least 80%.

Eligibility criteria

To be included in our systematic map, studies must meet the following criteria:

- Population: the team will include articles that deal only with small-scale populations (including indigenous people) inhabiting rural areas. Therefore, the team will exclude articles dealing with extensive rural properties, such as those dedicated to commercial monoculture directed towards commodity markets (e.g., agribusiness). Eligible small-scale populations include hunter-gatherers or foragers, mainly or at least partially subsistence-based family farmers or horticulturists, fishers using small and medium-sized wooden boats, pastoralists or herders, and family agropastoralists. Studies that deal with small-scale populations that moved to urban areas will be discarded, as will be those cases in which there is no specification of the target population.
- Outcomes: the article should address the concept of climate change perception, regardless of whether its definition will be presented explicitly or implicitly.
- Types of study design: the team will consider empirical studies based on primary data, employing quantitative or/and qualitative methods of data gathering.

The list of articles excluded at the full-text screening stage will be listed in an additional file together with the reasons for their exclusion.

Study validity assessment

Critical appraisal of the validity and quality of studies is optional in systematic mapping and should be adopted only when there is a sufficient level of methodological details, such as necessary to evaluate the external and internal validity of studies [45]. A process causality or its generalisation to specific contexts is irrelevant to our research. Instead, the team are interested in describing the variability in concept usage across studies to get an overview of the conceptual similarities and differences in the climate change literature. Because of that, we also do not intend to restrict our choice of eligible articles.

Data coding strategy

To check for intercoder consistency, two team members will independently code a sample of 1% of the total number of articles. The selection of these articles in the databases will follow the sort order by date in the output list, i.e. the team will read first the articles with the most recent dates appearing at the top of the list. After coding this article's sample, the review team will discuss inconsistencies and doubts. Decisions on disagreements will then be taken, when necessary, with the help of a third team member.

When coding, all the eligible articles will be double-screened to ensure consistency. Weekly team meetings will be arranged to discuss problems and align activities between reviewers to guarantee coding consistency.

While conducting full-text screening (described above), the team will perform data extraction and coding but will keep it only for those texts that meet the inclusion criteria. Data coding will rely on a codebook prepared before mapping begins (Additional file 4). Missing or unclear data will be specified in the process. The team will use the following structure for data extraction and coding for articles that met the eligibility criteria and were then selected for full reading. For more details of the items below, see Additional file 4.

- Bibliographic information: title, authors, journal, year, DOI.
- Study location: a general description of the country.
- Origin of the investigated population: all indigenous, all non-indigenous, mixed indigenous and non-indigenous, non-specified.
- Subsistence strategy of the investigated population: small-scale agriculturalist, small-scale agropastoralist, forager or hunter-gatherer or fisher-gatherer, horticulturalists, pastoralist or herder, other.
- Thematic areas covered in the article: adaptation, awareness, traditional knowledge with and without indicators, scientific knowledge, comparison between observations of individual perceptions with scientific data, observed changes in livelihood activities, observed changes in the environment, determining factors (i.e. perception drivers), mitigation, resilience, risk perception, another thematic area.
- Existence or nonexistence of explicit perception definition: explicit, implicit, other.
- Part of the text where the perception definition appears: introduction, methods, results, discussion, conclusion, other.
- Description of the explicit definition of perception of climate change: as described by the authors.
- Description of which construct(s) is(are) part of the climate change perception definition(s) adopted in the article, meaning that perception is measured, for instance, as the observation of changes in the environment; as a sensory experience; as people's belief that a climate change is occurring, attitudes, traditional knowledge, among others.
- Description of how perception is presented in the article's results, discussion or conclusion: regardless of whether or not there is a definition of perception,

for instance, perception is described as the observation of changes, perception is defined as traditional or scientific knowledge, or as the individual's degree of concern about the effects of climate change on livelihood activities, among others.
- Description of how perception appears in the results: as described by the authors (when explicit).
- Description of the phenomenon observed in the article: physical phenomenon, biological phenomenon, human phenomenon, other phenomenon.
- Description of the sampling unit of collected data in methods: individual level, household level, individual and household level, community level or village, organisations (e.g., NGOs, associations), others.
- Description of data used in the article to analyse methods: primary data, secondary data, primary and secondary data, others.
- Description of methods used in the article: qualitative methods, quantitative methods, mixed methods, others.

Data mapping method

The team will produce a database with the information extracted from the articles in Excel spreadsheet format. The complete worksheet will be made accessible in Additional files, including a catalogue with all definitions of perception identified by the reviewers.

The team intend to summarise the relevant results in a narrative synthesis and adopt analytical (e.g., descriptive statistics) and visualisation tools (e.g., maps tables, graphs and other figures) to present the mapping results, such as the following examples.

- Table: a synthesis with the description of the several concepts adopted in the literature, together with examples of the relevant studies.
- Graph—Temporal: describing the temporal trends in the frequency of definition usage.
- Figure—Evidence atlas: describing the location of all studies across the geographical space and subdivided in concept type if there are regional differences.
- Graph—Heat map: describing the usage of the alternative perception definitions (x-axis) by subsistence strategy (y-axis).
- Graph—Heat map: the construct of perception definitions (x-axis), by observation of phenomenon (y-axis).
- Graph—Two-dimensional categorial bubble plots: the origin of the investigated population (x-axis), by subsistence strategy of the surveyed population (y-axis).
- Graph—Two-dimensional categorial bubble plots: the origin of the investigated population (x-axis), by thematic areas covered in the article (y-axis).
- Graph—Two-dimensional categorial bubble plots: sampling unit (x-axis), by perception description in the results, discussion or conclusion (y-axis).
- Graph—Two-dimensional categorial bubble plots: continent (x-axis), by the origin of the investigated population (y-axis).

The presentation of crucial information will depend on the articles that pass the screening stage but will presumably contain information based on the Codebook.

A data file of all screened literature, with the reason for inclusion and exclusion and associated metadata will also be made available upon completion.

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s13750-022-00284-w.

Additional file 1. ROSES checklist of systematic map protocol.

Additional file 2. Search string development.

Additional file 3. List of the 95 articles used to assess the comprehensiveness of the search string.

Additional file 4. Codebook—Description of the data that will be extracted in the systematic map.

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Author contributions
LTT and CM contributed to revisions of the article drafts and read the final version of this systematic map protocol. Both authors read and approved the final manuscript.

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Availability of data and materials
Not applicable.

Declarations

Ethics approval and consent to participate
Not applicable.

Consent for publication
Not applicable.

Competing interests
The authors declare that they have no competing interests.

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Publisher's Note

Apêndice B - Protocolo *Reporting standards for Systematic Evidence (ROSES).*

READ ME

ROSES for Systematic Map Protocols. Version 1.0

November 2017

Neal R Haddaway, Biljana Macura, Paul Whaley, and Andrew Pullin

Column descriptions

Section/sub-section - The sections or sub-sections listed below correspond to sections in CEE systematic review and map protocols and final reports: please see the relevant text under these subheadings for information within a specific review.

Topic - the section or sub-section is further broken down for the purposes of clarity.

Description/Further explanation - Details of what is needed in each section or sub-section are provided, along with practical advice and links to relevant guidance.

Checklist/Meta-data - Checklist items MUST be completed. Meta-data items correspond to information that should be reported as data or short descriptions that will be used to populate the Summary Record and Flow Diagram. Any meta-data items where stages were not performed (e.g. grey literature searching), this should be stated (e.g. 'Not performed').

Author response - authors should select or write a response for meta-data, or select 'yes' or 'no' for checklist items. Further details may be provided in Comments (see below).

Comments - authors may supplement their response with a brief comment.

Please cite as: Haddaway NR, Macura B, Whaley P, and Pullin AS. 2017. ROSES for Systematic Map Protocols. Version 1.0. DOI: 10.6084/m9.figshare.5897284.

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Section / sub-section	Topic	Description	Further explanation	Checklist/ Meta-data	Author response	Comments
Title	Title	The title must indicate that it is a systematic map protocol, and must indicate if it is an update/amendment: e.g. "A systematic map update protocol...".	The title should normally be the same or very similar to the review question.	Meta-data	What evidence exists on conceptual differences in climate change perceptions of smallholders? A systematic map protocol	
Type of review	Type of review	Select one of the following types of review: systematic map, systematic map update, systematic map amendment	See CEE Guidance on systematic mapping [1], and on amendments and updates [2]	Meta-data	Systematic map	
Authors contacts	Authors contacts	The full names, institutional addresses, and email addresses for all authors must be provided.		Checklist	Yes	
Abstract	Structured summary	Abstract must not exceed 350 words and must include two sections 1) Background, the context and purpose of the review, including the review question; 2) Methods, how the review will be conducted and the outputs that are expected (specifically mention search strategy, inclusion criteria, critical appraisal, data extraction and synthesis).		Checklist	Yes	
Background	Background	Describe the rationale for the review in the context of what is already known. Protocol must indicate why this study was necessary and what it aims to contribute to the field.	A theory of change and/or conceptual model can be presented that links the intervention or exposure to the outcome.	Checklist	Yes	
Stakeholder engagement	Stakeholder engagement	The planned/actual role of stakeholders throughout the review process (e.g. in the formulation of the question) must be described and explained (using a broad definition of 'stakeholder', including e.g. researchers, funders and other decision-makers; see [3])		Checklist	No	
Objective of the review	Objective	Describe the primary question and secondary questions (when applicable).	The primary question is the main question of the review. Secondary questions are usually linked to sources of heterogeneity (effect modifiers).	Checklist	Yes	
	Definitions of the question components	Break down and summarise question key elements e.g. population, intervention(s)/exposure(s), comparator(s), and outcome(s).	For other question types see [4,5]	Meta-data	Population (P): Small-scale people living in rural areas, which consist of individuals who produce their resources for livelihood through family labour, with little or no ability to generate surplus production for the market. Exposure (E): Climate change will be considered as exposure. Outcome (O): Climate change perception definitions.	
Methods						
Searches	Search strategy		Details regarding search strategy testing should be provided.	Checklist	Yes	
	Search string	Provide Boolean-style full search string and state the platform for which the string is formatted (e.g. Web of Science format)		Meta-data	Scopus: (TITLE-ABS-KEY ((("perception*" OR "local perspective*" OR "awareness") AND ("climat* chang*" OR "global warming" OR "chang* climat*" OR "climat* variabilit*" OR "climat* event*") AND ("indigenous*" OR "smallholder*" OR "small scale*" OR "livelihood*" OR "fisher*" OR "peasant*" OR "hunter*" OR "agricultur*" OR "forager*" OR "agropastoralist*" OR "horticultur*" OR "pastoralist*" OR "herder*" OR "small-island*")))) WoS: ALL FIELDS ((("perception*" OR "local perspective*" OR "awareness") AND ("climat* chang*" OR "global warming" OR "chang* climat*" OR "climat* variabilit*" OR "climat* event*") AND ("indigenous*" OR "smallholder*" OR "small scale*" OR "livelihood*" OR "fisher*" OR "peasant*" OR "hunter*" OR "agricultur*" OR "forager*" OR "agropastoralist*" OR "horticultur*" OR "pastoralist*" OR "herder*" OR "small-island*")) BASE: Entire document: ("perception" OR "awareness") AND ("climate change" OR "global warming") AND ("indigenous" OR "smallholder" OR "small-island") Science Direct: Title, abstract, keywords: (("perception" OR "awareness") AND ("climate change" OR "global warming") AND ("indigenous" OR "smallholder" OR "small-island")) PubMed: (("perception" OR "awareness") AND ("climate change" OR "global warming") AND ("indigenous" OR "smallholder" OR "small-island"))	
	Languages – bibliographic databases	List languages to be used in bibliographic database searches.		Meta-data	English	
	Languages – grey literature	List languages to be used in organizational websites searches and web-based search engines.		Meta-data	English	
	Bibliographic databases	Provide the number of bibliographic databases to be searched.		Meta-data	5	Web of Science Core Collection, Scopus, BASE – Bielefeld Academic Search Engine, Science Direct Elsevier, PubMed

Section / sub-section	Topic	Description	Further explanation	Checklist/ Meta-data	Author response	Comments
	Web – based search engines	Provide the number of web – based search engines to be searched.		Meta-data	n/a	
	Organisational websites	Provide the number of organisational websites to be searched.		Meta-data	n/a	
	Estimating the comprehensiveness of the search	Describe the process by which the comprehensiveness of the search strategy was assessed (i.e. list of benchmark articles).		Checklist	Yes	Test list of 95 articles
	Search update	Describe any plans to update the searches during the conduct of the review.	Optional. A search update is good practice if original searches were performed more than two years prior to review completion.	Checklist	n/a	
Article screening and study inclusion criteria	Screening strategy	Describe the methodology for screening articles/studies for relevance/eligibility.		Checklist	Yes	Screening in two stages: first on title/abstract and then on full text.
	Consistency checking	Describe clearly the process for checking consistency of decisions including the levels at which consistency checking will be undertaken and estimated proportion of articles/studies that will be screened and checked for consistency by two or more reviewers (e.g. Titles (10%), abstracts (10%), full text (10%)).		Checklist	Yes	Initially, before coding, we will select 5% or 20 of the total sample to be coded independently by two review members to check for consistency and to clarify any doubt.
	Inclusion criteria	Describe the inclusion criteria used to assess relevance of identified articles/studies. These must be broken down into the question key elements (e.g. relevant subject(s), intervention(s)/exposure(s), comparator(s), outcomes, study design(s)) and any other restrictions (e.g. date ranges or languages).		Checklist	Yes	
	Reasons for exclusion	State that you will provide a list of articles excluded at full text with reasons for exclusion.		Checklist	Yes	
Critical appraisal	Critical appraisal strategy	Describe here the method you propose for critical appraisal of study validity (including assessment of individual studies and the evidence base as a whole).	Optional	Checklist	n/a	
	Critical appraisal used in synthesis	Describe how the information from critical appraisal will be used in synthesis.	Optional	Checklist	n/a	
	Consistency checking	Describe how repeatability of critical appraisal of study validity will be tested.	Optional	Checklist	n/a	
Data extraction	Meta-data extraction and coding strategy	Describe the method for meta-data extraction and coding for studies (potentially providing forms/data sheets (ideally piloted), list if variables to be extracted as meta-data and those that will be coded).		Checklist	Yes	Codebook provided in Additional file 4
Data synthesis and presentation	Narrative synthesis strategy	Describe methods to be used for narratively synthesising the evidence base in the form of descriptive statistics, tables (including SM database) and figures.	Vote-counting (tallying of studies based on the direction or significance of their findings) must be avoided. May include a summary of the outputs of critical appraisal of the evidence base as a whole (if planned to be performed in SM).	Checklist	Yes	
	Knowledge gap and cluster identification strategy	Describe the methods to be used to identify and/or prioritise key knowledge gaps (unrepresented or underrepresented subtopics that warrant further primary research) and knowledge clusters (well-represented subtopics that are amenable to full synthesis via systematic review).		Checklist	Yes	
	Demonstrating procedural independence	Describe the role of systematic reviewers (who have also authored articles to be considered within the review) in decisions regarding inclusion or critical appraisal of their own work.	Reviewers who have authored articles to be considered within the review should be prevented from unduly influencing inclusion decisions, for example by delegating tasks appropriately.	Checklist	Yes	
Declarations	Competing interests	Describe of any financial or non-financial competing interests that the review authors may have.		Checklist	Yes	

Apêndice C - *Codebook*

CODEBOOK: Description the data extracted for the systematic map.

A. BIBLIOGRAPHIC INFORMATION

- **Article ID:** a code number or combination of numbers (i.e., XXXX+YYYY), where XXXX is the current number as 0001, 0002,…,000n and YYYY is the year (e.g., 2020). For example, 00012020
- **Article source:**

1 = WoS Core Collection
2 = Scopus
3 = BASE
4 = Science Direct
5 = PubMed
6 = WoS and Scopus
7 = WoS and BASE
8 = WoS and Science Direct
9 = WoS and PubMed
10 = WoS, Scopus, BASE
11 = WoS, Scopus, Science Direct
12 = WoS, Scopus, PubMed
13= WoS, BASE, Science Direct
14 = WoS, BASE, PubMed
15 = WoS, Science Direct, PubMed
16= Scopus and BASE
17= Scopus and Science Direct
18= Scopus and PubMed
19= Scopus, BASE, Science Direct
20 = Scopus, Science Direct, PubMed
21 = Scopus, BASE, PubMed
22 = BASE and Science Direct
23 = BASE and PubMed
24 = BASE, Science Direct, PubMed
25 = Science Direct and PubMed
26 = WoS, Scopus, BASE, Science Direct
27 = WoS, Scopus, BASE, PubMed
28 = WoS, Scopus, Science Direct, PubMed
29 = WoS, Scopus, BASE, Science Direct, PubMed (all databases)
30= WoS, Science Direct, PubMed, BASE
31= Scopus, Science Direct, PubMed, BASE

- **Article title**: full text, e.g., "Determinants of choice of climate change adaptation practices by smallholder pineapple farmers in the semi-deciduous forest zone of Ghana".
- **Author(s):** text, e.g. Antwi-Agyei, P.; Wiafe, E.A.; Amanor, K.; Baffour-Ata, F.; Codjoe, S.N.A.
- **Journal:** text, e.g. Environmental and Sustainability Indicators
- **Year**: number (YYYY), e.g. 2020
- **DOI:** an alphanumeric string of characters, e.g., 10.1016/j.jenvman.2021.113801

B. STUDY GENERAL DESCRIPTION

- **Country number:** How many countries are described in the article?

1 = **One country:** the study was carried out only in one country.
2 = **Two countries**: the study was carried out in two countries.
3 = **Three countries**: the study was carried out in three countries.
4 = **Four countries**: the study was carried out in four countries.
5 = **More than five countries:** the study was carried out in more than five countries.
6 = **Others above five.**

- **Country one**: number (a combination of number X+YY, where X is the continent and YY refers to a country). From the list below, select only the first country.
- **Country two:** number (a combination of number X+YY, where X is the continent and YY is a country). From the list below, select only the second country. If not, write 0 (0=not applicable).
- **Country three:** number (a combination of number X+YY, where X is the continent and YY is a country). From the list below, select only the third country. If not, write 0 (0=not applicable).
- **Country four:** number (a combination of number X+YY, where X is the continent and YY is a country). From the list below, select only the fourth country. If not, write 0 (0=not applicable).
- **Country five:** number (a combination of number X+YY, where X is the continent and YY is a country). From the list below, select only the fifth country. If not, write 0 (0=not applicable).

List of countries:

0 = Not applicable.
1 = Africa
101 = Algeria

102 = Angola
103 = Benin
104 = Botswana
105 = Burkina Faso
106 = Burundi
107 = Cabo Verde/Cape Verde
108 = Cameroon
109 = Central African Republic (the)
110 = Chad
111 = Comoros (the)
112 = Congo/Republic of the Congo
113 = Democratic Republic of the Congo
114 = Djibouti
115 = Egypt (transcontinental - generally considered African)
116 = Equatorial Guinea
117 = Eritrea
118 = Eswatini (formerly Swaziland)
119 = Ethiopia
120 = Gabon
121 = Gambia, The
122 = Ghana
123 = Guinea
124 = Guinea-Bissau
125 = Ivory Coast/Republic of Côte d'Ivoire
126 = Kenya
127 = Lesotho
128 = Liberia
129 = Libya
130 = Madagascar
131 = Malawi
132 = Mali
133 = Mauritania
134 = Mauritius
135 = Morocco
136 = Mozambique
137 = Namibia
138 = Niger
139 = Nigeria
140 = Rwanda
141 = Sao Tome and Principe
142 = Senegal
143 = Seychelles
144 = Sierra Leone
145 = Somalia
146 = South Africa
147 = South Sudan
148 = Sudan
149 = Tanzania
150 = Togo
151 = Tunisia
152 = Uganda
153 = Zambia
154 = Zimbabwe
2 = Asia
201 = Afghanistan
202 = Armenia (transcontinental - generally considered Asian)
203 = Azerbaijan (transcontinental - generally considered Asian)
204 = Bahrain
205 = Bangladesh
206 = Bhutan
207 = British Indian Ocean Territory (UK territory)
208 = Brunei Darussalam
209 = Cambodia
210 = China
211 = Hong Kong (China - Special Administrative Region)
212 = India
213 = Indonesia

214 = Iran
215 = Iraq
216 = Israel (U.N. member, though partially unrecognized)
217 = Japan
218 = Jordan
219 = Kazakhstan (transcontinental - generally considered Asian)
220 = Kuwait
221 = Kyrgyzstan
222 = Laos
223 = Lebanon
224 = Macau (China - Special Administrative Region)
225 = Malaysia
226. = Maldives
227 = Mongolia
228 = Myanmar (formerly Burma)
229 = Nepal
230 = North Korea (Democratic People's Republic of Korea)
231 = Oman
232 = Pakistan
233 = Palestine (limited recognition)
234 = Philippines
235 = Qatar
236 = Saudi Arabia
237 = Singapore
238 = South Korea (Republic of Korea)
239 = Sri Lanka
240 = Syria
241 = Taiwan (limited recognition - claimed by China)
242 = Tajikistan
243 = Thailand
244 = Timor-Leste/East Timor
245 = Turkey (transcontinental - generally considered European)
246 = Turkmenistan
247 = United Arab Emirates
248 = Uzbekistan
249 = Vietnam
250 = Yemen
3 = Europe
301 = Albania
302 = Andorra
303 = Austria
304 = Belarus
305 = Belgium
306 = Bosnia and Herzegovina
307 = Bulgaria
308 = Croatia
309 = Cyprus (generally considered European)
310 = Czechia/Czech Republic
311 = Denmark
312 = Estonia
313 = Finland
314 = France
315 = Georgia (transcontinental)
316 = Germany
317 = Greece
318 = Hungary
319 = Iceland
320 = Ireland
321 = Italy
322 = Latvia
323 = Liechtenstein
324 = Lithuania
325 = Luxembourg
326 = Malta
327 = Moldova (Republic of Moldova)
328 = Monaco
329 = Montenegro

330 = Netherlands
331 = North Macedonia
332 = Norway
333 = Poland
334 = Portugal
335 = Romania
336 = Russia (transcontinental - generally considered European)
337 = San Marino
338 = Serbia
339 = Slovakia
340 = Slovenia
341 = Spain
342 = Sweden
343 = Switzerland
344 = Ukraine
345 = United Kingdom
346 = Vatican City (Holy See)*
4 = North America
401 = Antigua and Barbuda
402 = Bahamas
403 = Barbados
404 = Belize
405 = Canada
406 = Costa Rica
407 = Cuba
408 = Dominica
409 = Dominican Republic
410 = El Salvador
411 = Grenada
412 = Guatemala
413 = Haiti
414 = Honduras
415 = Jamaica
416 = Mexico
417 = Nicaragua
418 = Panama
419 = Saint Kitts and Nevis
420 = Saint Lucia
421 = Saint Vincent and the Grenadines
422 = Trinidad and Tobago
423 = United States of America
5 = Oceania
501 = Australia
502 = Fiji
503 = Kiribati
504 = Marshall Islands
505 = Micronesia (The Federated States of)
506 = Nauru
507 = New Zealand
508 = Palau
509 = Papua New Guinea
510 = Samoa
511 = Solomon Islands
512 = Tonga
513 = Tuvalu
514 = Vanuatu
6 = South America
601 = Argentina
602 = Bolivia
603 = Brazil
604 = Chile
605 = Colombia
606 = Ecuador
607 = Guyana
608 = Paraguay
609 = Peru
610 = Suriname

611 = Uruguay
612 = Venezuela
7 = Unknown
8 = Another country

C. POPULATION DESCRIPTION

- **Origin of the investigated population:** choose the option that best describes the population investigated in the article.

1 = **All indigenous.** We will consider as indigenous those inhabitants of rural (non-urban) areas, entitled in the article as indigenous, native, native people, autochthonous, aboriginal, even if described in the article as an emerging society (i.e., when they reassume their indigenous identity after some time). Indigenous peoples are considered those that: (i) share inter-generational ancestry and cultural aspects with original (pre-colonial or pre-invasion) occupants of ancestral lands in a specific region of the world; (ii) consider themselves distinct from other sectors of the current prevailing societies; (iii) usually speak a different language; (iv) have diverse cultures and worldviews; (v) often aim to preserve, develop, and transmit to future generations their ancestral territories and ethnic identities, as the basis of their continued existence as a society; (vi) have and are determined to maintain their own cultural patterns, social institutions, and common-law system; (vii) often share deep social, cultural, and spiritual ties to their ''lands'' (a term that captures Indigenous territories in general, including terrestrial, water, and associated spiritual environments), and (viii) their livelihoods, health, and well-being are closely linked to activities such as hunting, fishing, herding, foraging, small-scale family farming, and land and/or water management practices that have developed over many generations.

0 = **All non-indigenous.** We will consider small-scale populations living in rural (non-urban) areas as non-indigenous, when: (i) entitled in the article as a farmer, peasant, smallholder, small-scale fisher, small-scale hunter, and (ii) not accompanied by terms such as an indigenous person, native, autochthonous, native people, aboriginal, among others.

2 = **Mixed indigenous and non-indigenous**. We will consider mixed when the article deals with the two types of populations (indigenous and non-indigenous), whether these populations belong to the same place or from two or more different locations.

3 = **Not specified in the text.**

4 = **Another specified origin, but not listed above.**

- **Subsistence strategy of the investigated population:**

Rule: consider, in this order, (i) the subsistence activity described as the main one in the article; (ii) when not classified or highlighted, choose the most frequent/most often performed activity (in time); (iii) if missing, choose the activity that people allocate more time to; (iv) when missing, consider the activity that generates the most significant percentage of income (total income and, if absent, monetary income).

1 = **Small-scale Agriculturalist** are individuals who: (i) practice agriculture mainly to their subsistence; (ii) practice land use involving crop rotation or permanent cultivation in the same year or for more years; (iii) may involve labour beyond the nuclear family; (iv) may use tools (mainly manual), but do not rely on mechanisation; (v) they can sell part of their production on the market as a complement to their income. Agriculture based on monocultures directed to agribusinesses are excluded.

2 = **Small-scale Agropastoralists** rely mainly on agriculture and pastoralism for their subsistence. They might sell part of their agricultural or animal production to raise some cash, but the output is not directed only nor mainly to markets.

3 = **Forager, Hunter-Gatherer or Fisher-Gatherer** are individuals who: (i) practice subsistence-based on HUNTING wild animals, FISHING, and GATHERING wild plants as their primary subsistence strategy; (ii) they do not rely on plant or animal domestication; (iii) division of labour tends to be by age and gender; (iv) often live in small groups (band-organised), which may concentrate in larger groups and, subsequently, disperse; (v) are currently or used to be nomadic in natural landscapes; (vi) their lands tenure is often a common property regime (a kinship-based collective holds land with rules of reciprocal access); (vii) sharing and reciprocity are central rules of their social interaction; (viii) are more egalitarian.

31 = **Fisher-Gatherer.** Foragers depend mainly on fishing for their subsistence and as a source of protein.

32 = **Hunter-Gatherer.** Foragers depend mainly on hunting for their subsistence and as a source of protein.

4 = **Horticulturists** are individuals who: (i) are small-scale (often family) farmers who produce mainly for their consumption (i.e., subsistence farmers) but may trade the surplus of their production; (ii) depend on domesticated plants and trees for the bulk of their food energy; (iii) may raise a few animals for their consumption (or as saving); (iv) gender division of labour is standard, and labour is provided by the producer's nuclear or extended family; (v) form permanent settlements with a few dozens to several hundred people in well-defined villages or clan territories; (vi) fields are often used for only a couple of years and then allowed to fallow 2 to 15 years; (vii) generally, practice shifting cultivation; (viii) often, but not only, practice slash-and-burn agriculture; (ix) farming is often practised together with foraging activities; (x) use hand tools to cultivate.

41 = **Horticulturalist with fishing.** Horticulturists who depend mainly on fishing as a source of protein (subsistence).

42 = **Horticulturalist with hunting**. Horticulturists who depend mainly on hunting as a source of protein (subsistence).

5 = **Pastoralists or herders** are individuals who: (i) herd animals as their primary source of subsistence (e.g. cattle, camels, sheep, goats, llamas, yaks, reindeer, horses) found in various parts of the world; (ii) use animals not only as food (e.g. meat, milk, cheese, butter), but also for fur, bones and as beasts of burden; (iii) often sell some animals or animal products to raise cash, as a complementary strategy; (iv) land use is extensive with animals moved to pasture instead of fodder brought to them; (v) may practice agriculture for own consumption or to feed animals, but this is not how they spend most of their time (often seasonally); (vi) rely on the gender division of labour; (vii) there are sedentary pastoralists, but most of them are nomadic, moving seasonally or temporarily to pastures as needed; (viii) rely on a concept of ownership restricted to animals, housing and some domestic goods, but not land.

6 = **Another specified subsistence category, but not listed above.**

7 = **Non-specified.**

8 =**Fishers** are individuals who depend mainly on fishing for their subsistence and as a source of protein. Consider fishers, when the only description of the activity performed is fishing activity.

D. OUTCOME DESCRIPTION

- **Definition form:** how the perception definition appears in the text.

1 = **Explicit:** when definitions are explicitly written, i.e., with a direct explanation in the text in alternative forms such as perception (or any other construct) is, perception equals, local perception means, among others.

0 = **Implicit:** when definitions are not explicitly written, i.e., the article does not contain a description of the perception concept, but refers to it indirectly (i.e., do not use "perception—or any other equivalent construct— is, perception equals, local perception means", among others). Consider as implicit when it appears, for instance, only how it was measured in the methods or results.

2 = **Another.**

- **Definition where:** part of the text where the definition appears**.**

0 = Not applicable.
1 = Introduction
2 = Methods
3 = Results

4 = Discussion
5 = Conclusion
6 = Another part not specified.

- **Definition term adopted:** text or n⁄a (not applicable). Copy exactly the sentence that contains the explicit definition of perception. The definition may be taken from other authors. For example, the article is from "Cardoso et al., 2020", but the definition is from "Barbosa et al., 1996". Include a note on this.

- **Perception as a construct:** Is the perception construct part of the definition of perception? 0=No; 1=Yes. Consider perception "the set of processes by which we recognise, organise, and make sense of the sensations we receive from environmental stimuli" (Sternberg; Sternberg; Mio, 2012, p. 535). Perception includes sensory experience, including sight, hearing, touch, taste, smell, and other stimuli received from the environment. The person interprets the stimuli into something meaningful based on prior experiences, knowledge and subjective interpretations of reality (Pike; Edgar; Edgar, 2012; Sternberg; Sternberg; Mio, 2012). Sensory experiences include observation.
- **Awareness as a construct:** Is the awareness construct part of the definition of perception? 0=No; 1=Yes. Consider awareness in the context of climate change (CC) as "the process to perceive and understand CC as a hazard as well as to increase the willingness of taking action in a committed and collaborative way to adapt and face the challenges of CC" (Iturriza et al., 2020, p.3). Awareness of climate change comprises the perception of climate change as a problem and threat (Arlt; Hoppe; Wolling, 2011).
- **Consciousness as a construct:** Is the consciousness construct part of the definition of perception? 0=No; 1=Yes. The concept of consciousness in cognitive psychology "encompasses the state of being awake, our ability to control our behaviour and be aware of our surroundings, and our mental experiences" (Andrade, 2012, p. 583). Consciousness consists of a multidimensional set of psychological constructs such as beliefs, attitudes, knowledge, values and taking action (behaviour) (Sánchez & Lafuente, 2010; Triantafyllidou & Zabaniotou, 2021). Synonyms of consciousness are environmental concern or environmental consciousness (Sánchez & Lafuente, 2010). Environmental consciousness can lead to pro-environmental behaviour in climate change, i.e., individuals who have an environmental consciousness can take actions that mitigate, minimise, or avoid the adverse impacts of climate change.
- **Attitude as a construct:** Is the attitude construct part of the definition of perception? 0=No; 1=Yes. Consider attitude "a psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour" (Chaiken & Eagly, 1993, p.1) towards climate change. "Attitudes have a subject matter, which can be an object, a person, or an abstract idea" (Albarracin & Shavitt, 2018, p. 300).
- **Belief as a construct:** Is the belief construct part of the definition of perception? 0=No; 1=Yes. Consider belief as "a personal conviction that is not necessarily supported by science-based evidence - but that is shaped by the overall context in which they occur, including the scientific understanding we have of it" (Sousa-Silva et al., 2016, p.2). Aspects learned from experience or at school, or even misconceptions and incomplete truths people believe are valid beliefs (Ardoin; Heimlich; Braus & Merrick, 2013). For example, people perceive climate change processes as a threat or natural phenomenon despite no scientific knowledge.
- **Concern as a construct:** Is the concern construct part of the definition of perception? 0=No; 1=Yes. Consider concern as a feeling of worry about the outcomes and consequences of climate change (Poortinga et al., 2019).
- **Direct experience construct:** Is the direct experience construct part of the definition of perception? 0=No; 1=Yes. Consider direct experience as experiencing, observing, having contact with effects of climate change directly, i.e. the individual is directly exposed, has a real adventure, is personally experiencing or observing signals of climate change situation such as heatwaves, changes to seasons, warmer winters or summers, less rain, milder winters, less snow, change to animal or plant species (Akerlof et al. 2013).
- **Indirect experience construct:** Is an indirect experience part of the perception definition? 0=No; 1=Yes. Consider as indirect experience as experiencing, observing, having contact with the effects of climate change indirectly, i.e. the individual is physically distant from the climate change situation and maybe listening about, reading or visualising the phenomenon in another person/location (Hamilton-Webb et al., 2017). Indirect experience may include: (i) observing another individual and feeling what he feels, through second or third-hand accounts from people known or unknown (vicarious experience) (Paton et al., 2000), and (ii) experience the phenomenon through media coverage, newspapers, television, internet (virtual experience).
- **Scientific knowledge construct:** Is the scientific knowledge construct part of the definition of perception? 0=No; 1=Yes. Consider scientific knowledge "usually referring to the often explicit knowledge that has been derived from applying more formal methods that aim to increase rigour in relation to different positions on validity and reliability. This includes natural science and social science research" (Raymond et al., 2010, p. 1769).
- **Traditional or indigenous or local knowledge construct:** Is the traditional knowledge construct part of the definition of perception? 0=No; 1=Yes. Consider traditional knowledge "the knowledge, innovations, and practices of both indigenous and local communities around the world that are deeply grounded in history and experience" (IPCC, 2014, p.1774). Therefore, the knowledge that: (i) tends to be the result of cumulative experience and observation, tested in the context of everyday life; (ii) devolved by oral communication and repetitive engagement rather than through formal instruction; (iii) dynamic and adapted to cultural and environmental changes, and (iv) generally transmitted orally from generation to generation (IPCC, 2014).
- **Risk perception construct:** Is the risk perception construct part of the definition of perception? 0=No; 1=Yes. Consider risk perception the "subjective judgment that people make about the characteristics and severity of a risk" (IPCC, 2014, p.1772), in this case, risks associated with climate changes. Risk is often represented as the "probability of occurrence of hazardous events or trends multiplied by the impacts if these events or trends occur. Risk of a certain person or community results from the interaction of its vulnerability, exposure, and hazard associated with climate change" (IPCC, 2014, p.1772).
- **Worldview construct:** Is the worldview construct part of the definition of perception? 0=No; 1=Yes. A worldview implies a coherent and broad set of values related to a particular aspect of life (Kalberg, 2004), in this case, climate change. Consider worldview as people's system of values that organise and integrate what they have learned about the world and themselves (e.g. through experience) in a symbolic representation system related to their views about climate change (Aerts; Van Belle; Van der Veken, 2012).
- **Another construct:** Is another construct part of the definition of perception? 0=No; 1=Yes.

- **Perception description:** how the perception concept appears in the results, discussion or conclusion, regardless of whether perception is defined.

1 = **Observation:** Perception is described as the OBSERVATION by an individual of changes in specific environmental aspects considered as EXTREME EVENTS OR ANOMALIE of climatic variability (e.g. individual reports changes—increases or decreases—in factors such as temperature, precipitation, drought and/or biophysical indicators, e.g., a person reports changes in plant flowering). Consider as extreme events or anomalies the following terms that may be accompanied by the words such as "extreme" or "anomalies": storm, landslide, tornado, fire, drought, heatwave, cold wave, frost, forest fire, lightning, cyclone, hurricane, gale or flood.

2 = **Traditional Knowledge**: Perception is described through an individual's TRADITIONAL KNOWLEDGE of the weather or climate variability using a range of indicators or not that enable people to predict weather and climate. Traditional knowledge of climate change can include knowing what climate change is, its causes, and its effects when understood from forms of traditional knowledge. Consider as traditional knowledge when referred to this term in the article.

3 = **Scientific Knowledge:** Perception is described through an individual's SCIENTIFIC KNOWLEDGE of the weather or climate variability using meteorological information, information from scientists or computer models to predict weather and climate. This scientific knowledge of climate change can include knowing what it is, its causes, and its effects when obtained from these forms of scientific knowledge. Consider as scientific knowledge when it is referred like this in the article.

4 = **Information:** Perception is described through an individual's KNOWLEDGE of the weather or climate variability using information coming from people outside the community, such as from radio, television, newspapers, magazines, books or the internet. This knowledge of climate change can include knowing what climate change is, its causes, and its effects when obtained from these sources of information.

5 = **Concern:** Perception is described as the individual's degree of concern about the effects of climate change on livelihood activities. According to Kumar, Pandey & Anand, 2019, "livelihood is ability to obtain the basic necessities in life such as food, water, shelter, and clothing and all other necessities which required for human survival" (Kumar, Pandey & Anand, 2019, p.47).
6= **There is no description.**
7= **Another specific description, but not specified above**.

- **Definition description in results:** text or n/a (not applicable, i.e. when there is no description in the results). Copy exactly the sentence that contains the description of perception.

- **Observation of physical phenomenon:** Was the perception of a physical phenomenon reported in the article? 0=No; 1=Yes. Consider observing a physical phenomenon, the observation of changes or not in temperature, precipitation, wind, the emergence of extreme weather events or anomalies (e.g. drought, hurricane, fire, landslide, flood, tornado, among others), or changes in the seasons.
- **Observation of biological phenomenon:** Was the perception of a biological phenomenon reported in the article? 0=No; 1=Yes. Consider the observation of a biological phenomenon the observation of changes or not in plants (e.g., the flowering of a particular plant, vegetation cover, and invasive species), animals (e.g., the appearance of a specific animal, disappearance of insects, emergence of pests, invasive species) and other living beings.
- **Observation of human phenomenon:** Was the perception of a human phenomenon reported in the article? 0=No; 1=Yes. Consider the observation of any human phenomenon the observation of changes in subsistence practices (e.g., change in the period of performance of the activity or its non-performance); changes in human health (e.g., the emergence of diseases, basic sanitation); changes in the availability of food, human migration, or loss/gain of traditional knowledge.
- **Observation of another phenomenon:** Was the perception of another phenomenon reported in the article? 0=No; 1=Yes.

E. THEMATIC AREAS

- **Adaptation:** Does the article have adaptation as a theme? 0=No; 1=Yes. Consider adaptation as addressing measures, initiatives, coping strategies adopted or in the process of being planned to reduce or prevent the current and/or expected adverse effects of climate change, regardless of who is implementing them (affected population, government, NGOs, etc.). Consider an adaptation when referred to as adaptation or adaptive capacity or adaptive measure in the article.
- **Awareness:** Does the article have awareness as a theme? 0=No; 1=Yes. Consider awareness as the state or ability to perceive, feel, or be conscious of events, objects, or sensory patterns. Consider awareness when it is referred to as awareness in the article.
- **Traditional knowledge with indicators:** Does the article have traditional knowledge with indicators as a theme? 0=No; 1=Yes. Consider the articles with traditional knowledge when addressing physical (e.g., clouds, star position, atmospheric aspects) and biological indicators (e.g., animal behaviour, plant flowering, insect presence).
- **Traditional knowledge without indicators:** Does the article have traditional knowledge without indicators as a theme? 0=No; 1=Yes. Consider the pieces without traditional knowledge without addressing physical or biological indicators.
- **Scientific knowledge:** Does the article have scientific knowledge as a theme? 0=No; 1=Yes. Consider scientific knowledge when the paper presents information from meteorological data, on physical data, or any other data type gathered by scientists and researchers, or when it is referred to as scientific knowledge in the article.
- **Comparison between observations of individuals with scientific data:** Does the article compare individual observations with scientific data as a theme? 0=No; 1=Yes. For example, it compares meteorological or instrumental data with personal views about climate variability and/or climate anomalies.
- **Observed changes in livelihood activities:** Does the article have observed changes in the livelihood activities as a theme? 0=No; 1=Yes. Consider observed changes in livelihood activities the description of changes and their impacts on any aspect of people's lives, such as on agricultural productivity, cash income, among others substance activities. According to Kumar, Pandey & Anand, 2019, "livelihood is ability to obtain the basic necessities in life such as food, water, shelter, and clothing and all other necessities which required for human survival" (Kumar, Pandey & Anand, 2019, p.47).
- **Observed changes in the environment:** Does the article describe the observed changes in the environment as a theme? 0=No; 1=Yes. Consider observed changes in the environment as the description of environmental changes (e.g., increased drought) and the environmental impacts resulting from these changes.
- **Determining factors**: Does the article investigate the determinants or drivers that may affect individual perceptions as a theme? 0=No; 1=Yes. Consider as determining factors the age, sex, education, monetary income, access to information, among others.
- **Mitigation:** Does the article have mitigation as a theme? 0=No; 1=Yes. Consider mitigation of the technological changes and/or other types of substitutions that reduce greenhouse gas emissions or that act to reduce these gases and aerosols. Consider as mitigation regardless of who is implementing them (affected population, government, NGOs, etc.).
- **Resilience:** Does the article have resilience as a theme? 0=No; 1=Yes. Consider as resilience the capacity of social, economic, and environmental systems to respond or cope in the face of a hazardous event, a trend or any disturbance. Consider resilience when individuals or groups respond to hazards or reorganise in ways that maintain their essential function, identity, and structure, while also maintaining the capacity for adaptation, learning, and transformation.
- **Risk perception:** Does the article have risk perception as a theme? 0=No; 1=Yes. Consider people's subjective judgment about the characteristics and severity as risk perception.
- **Another thematic area:** Does the article have another thematic area as a theme? 0=No; 1=Yes.
- **What another thematic area:** describe another thematic area**.**

F. METHODS

- **Sampling unit:** sampling unit of collected data:

0 = **Not applicable**.
1 = **Individual level:** The sampling unit is the individual, i.e., subject.
2 = **Household level**: when the sampling unit is the household. Households refer to a group of individuals who live together, share the same food resources and aspects of consumption, and allocate a common set of resources (including work) to guarantee their material reproduction.
3 = **Individual and household level:** The article deals with two sampling units, the individual and the household.
4 = **Community or village:** when the sampling unit is a community of any type, i.e. referring to the residents of a community or a village. A community or village consists of a population cluster of a few houses in an environment that is not urban and economic activities at least partially rely on natural resources, including agriculture and animal husbandry. The community or village may be home to indigenous societies or smallholders. In this study, communities and villages do not refer to towns.
5 = **Organisations (e.g., NGOs, associations):** when the sampling unit is an organisation, such as associations, non-governmental and governmental organisations.
6 = **Another sampling unit not specified above.**

- **Data:** source of data used in the article for the analysis.

0 = **Not applicable.**
1 = **Primary data:** the researcher(s) collected in the field.

2 = **Secondary data:** not collected in the field by the researcher, coming from research institutions, government, other articles, among places other than the field.

3 = **Primary and secondary data: we will consider primary** and secondary data when the article deals with the two data types.

4 = **Another data source not specified above.**

- **Methods**: methods used in the article.

0 = **Not applicable.**

1 = **Qualitative methods:** e.g., informal interview, participatory approaches, semi-structured interview when you say it was qualitative, focus group, participant observation.

2 = **Quantitative methods:** e.g., structured interview, semi-structured interview, systematic observation.

3 = **Mixed methods**: include at least one qualitative and one quantitative method.

4 = **Another method type not specified above.**

G. THEORETICAL FOUNDATION

- **Theory of Planned Behavior:** Does the article adopt the Theory of Planned Behaviour as a framework of analysis or discussion? 0=No; 1=Yes.
- **Theory of Reasoned Action:** Does the article adopt the Theory of Reasoned Action as a framework of analysis or discussion? 0=No; 1=Yes.
- **Value-Believe-Norm (VBN):** Does the article adopt the Value-Belief-Norm framework for analysis or discussion? 0=No; 1=Yes.
- **Cognitive biases:** Does the article adopt any type of cognitive bias as a framework of analysis or discussion? 0=No; 1=Yes.
- **Theory of social norms:** Does the article adopt the Theory of Social Norms or the concept of social norms as a framework of analysis or discussion? 0=No; 1=Yes.
- **Cognitive dissonance theory:** Does the article adopt the Cognitive Dissonance Theory as a framework of analysis or discussion? 0=No; 1=Yes.
- **Another theory.**
- **What Theory:** describe which theory.

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Apêndice D - Processo de elaboração da *string*.

Search string development.

This document summarizes the main steps taken to identify search terms and develop the search string. For this, we defined a set of keywords by consulting scientific articles in the area of climate change. For the constructing exercise to build the search string, we performed searches on the Web of Science Core Collection (WoS) and Scopus databases on Topic (TS). We built the search string through several steps detailed below, starting on 04/30/2021 and ending on 07/11/2022, in the preparation of the protocol.

As described in our protocol, we use Boolean operators, alternate terms, and asterisks. We used the asterisk to allow the identification of singular or plural words in the same search. We compiled our search strings using the following key terms: perception, awareness, climate change, and small-scale population. We separated the key terms by parentheses and use quotation marks in every word.

Search String nº 1 and nº 2

We started string testing in Scopus and WoS on April 2021. This was the first search string:

("climate change" OR "environmental change") AND ("perception" OR "perceived" OR "awareness") AND ("indigenous people*" OR "smallholder" OR "small group" OR "indigenous group")*

The result of the first test resulted in 483 publications in Scopus and 517 in WoS, a number considered low compared to the wide coverage that both databases have. Therefore, we decided to redo the tests.

After the first test of the string, we started testing which terms made a difference or not in the results. We saw that the term "indigenous group" could be dropped, resulting in 516 publications in Scopus and 482 in WoS. This was the second search string:

("climate change" OR "environmental change") AND ("perception" OR "perceived" OR "awareness") AND ("indigenous people*" OR "smallholder" OR "small group")*

Search String nº 3 and nº 4

As we are interested in small-scale populations, we decided to insert the term “small scale” in our string, which resulted in 666 publications in Scopus and 720 in WoS. We observed that the hyphen in "small scale" did not make a difference in the string, because of this we chose to leave it without a hyphen.

("climate change" OR "environmental change") AND ("perception" OR "perceived" OR "awareness") AND ("indigenous people*" OR "smallholder" OR "small group" OR “small scale")*

We also added the asterisk in the term "small group" and in "small scale" so that it also represented both words in the plural. This sequence increased by one publication in Scopus (N=667) and 9 in WoS (N=729), resulting in the following string:

("climate change" OR "environmental change") AND ("perception" OR "perceived" OR "awareness") AND ("indigenous people*" OR "smallholder" OR "small group*" OR “small scale*")*

We saw that changing the order of groups of terms in the string (i.e. *("perception*"OR “perceived" OR "awareness") AND ("climate change" OR "environmental change") AND ("indigenous people*" OR "smallholder" OR "small group*" OR “small scale*")*) does not influence the final search result.

Search String nº 5 and nº 6

We chose to add the term "global warming", resulting in 684 publications in Scopus and 741 in WoS.

("perception" OR "perceived" OR "awareness") AND ("climate change" OR "environmental change" OR “global warming”) AND ("indigenous people*" OR "smallholder" OR "small group*" OR “small scale*")*

The term "smallholder" proved to be important in the string, because when we excluded it, the number of publications decreased to 364 in Scopus and 371 in WoS. Therefore, we chose to keep it in the string and added asterisk, resulting in 685 publications in Scopus and 781 in WoS. Adding the term "climate change perception" had no effect on the increase in publications, so it was not included in the string. In order to increase the scope of the results for words that could be written in the plural, we put the asterisk in “climate change” and “environmental change”. The change returned 692 publications in Scopus and 810 in WoS and the string as follow below:

("perception" OR "perceived" OR "awareness") AND ("climat* chang*" OR "environment* chang*" OR “global warming”) AND ("indigenous people*" OR “smallholder*” OR "small group*" OR “small scale*")*

Search String nº 7 and nº 8

In addition to the term "climat* chang*, we chose to include first the term "chang* climat*", resulting in 697 publications in Scopus and 819 in WoS.

("perception" OR "perceived" OR "awareness") AND ("climat* chang*" OR "environment* chang*" OR “global warming” OR “chang* climat*”) AND ("indigenous people*" OR “smallholder*” OR "small group*" OR “small scale*")*

We also chose to insert the term “climat* variability”, returning 721 publications in Scopus and 842 in WoS.

("perception" OR "perceived" OR "awareness") AND ("climat* chang*" OR "environment* chang*" OR “global warming” OR “chang* climat*” OR “climat* variability”) AND ("indigenous people*" OR “smallholder*” OR "small group*" OR “small scale*")*

Search String nº 9 and nº 10

When we added the term "rural" the searches increased (1,667 publications in Scopus and 2,222 in WoS). The increase was also verified when we entered "livelihood*" (2,263 publications in Scopus and 2,816 publications in WoS), according to the string below:

("perception" OR "perceived" OR "awareness") AND ("climat* chang*" OR "environment* chang*" OR “global warming” OR “chang* climat*” OR “climat* variability”) AND ("indigenous people*" OR “smallholder*” OR "small group*" OR “small scale*" OR “rural” OR “livelihood*”)*

We added the term "indigenous" without the word people, resulting in 2,472 publications in Scopus and 3,037 in WoS.

("perception" OR "perceived" OR "awareness") AND ("climat* chang*" OR "environment* chang*" OR “global warming” OR “chang* climat*” OR “climat* variability”) AND ("indigenous people*" OR “indigenous” OR “smallholder*” OR "small group*" OR “small scale*" OR “rural” OR “livelihood*”)*

Search String nº 11 and nº 12

We changed the term "perceived" to "perceive" and added “local perspective*” and “climat* event*”, returning 2,570 publications in Scopus and 3,122 publications in WoS, as follow below:

("perception" OR "perceive*" OR “local perspective*” OR "awareness") AND ("climat* chang*" OR "environment* chang*" OR “global warming” OR “chang* climat*” OR “climat* variability” OR “climat* event*”) AND ("indigenous people*" OR “smallholder*” OR "small group*" OR “small scale*" OR “rural” OR “livelihood*”)*

When we added the term "farm*", the search results were for 3,604 in Scopus and 4,169 in WoS, according to the following string:

("perception" OR "perceive*" OR “local perspective*” OR "awareness") AND ("climat* chang*" OR "environment* chang*" OR “global warming” OR “chang* climat*” OR “climat* variability” OR “climat* event*”) AND ("indigenous people*" OR “smallholder*” OR "small group*" OR “small scale*" OR “rural” OR “livelihood*” OR “farm*”)*

Search String nº 13 and nº 14

We deleted the term "environment* chang*" as it involves changes other than climate change, and we chose to remove the term "indigenous people*", as we understand that term "indigenous" is sufficient. Added asterisk in “climat* variabilit*” to include more publications (3,477 publications in Scopus and 4,109 in WoS).

(“perception” OR “perceive*” OR “local perspective*” OR “awareness”) AND (“climat* chang*” OR “global warming” OR “chang* climat*” OR “climat* variabilit*” OR “climat* event*”) AND (“indigenous*” OR “smallholder*” OR “small group*” OR “small scale*” OR “rural” OR “livelihood*” OR “farm*”)*

To further specify our search, we replaced the terms “rural” and “farm*” with “subsistence”, as we are interested in small-scale populations that engage in subsistence activities. In addition, we added more details about this population of interest, with the terms "fisher*", "peasant*", "hunt*", "agricultur*", "forager*", "hunter-gather", "gather*", "agropastoralist*", "horticultur*", "pastoralist*".

("perception" OR "perceive*" OR "local perspective*" OR "awareness") AND ("climat* chang*" OR "global warming" OR "chang* climat*" OR "climat* variabilit*" OR "climat* event*") AND ("indigenous*" OR "smallholder*" OR "small group*" OR "small scale*" OR "livelihood*" OR "subsistence") AND ("fisher*" OR "peasant*" OR "hunt*" OR "agricultur*" OR "forager*" OR "hunter-gather" OR "gather*" OR "agropastoralist*" OR "horticultur*" OR "pastoralist*")*

Search String nº 15 and nº 16

We excluded the term "small group", as it was returning posts with other meanings, such as small group of smartphone, small group of users, small group discussion, small-group deliberations, small-group sea level rise discussions or small group of residents. Furthermore, we excluded the terms “subsistence” and “gather*”. Our searches result in 924 publications in Scopus and 1,197 in WoS. We saw that "hunter-gather" term had no effect on the results, the search resulted in the same number of publications in both databases, so we excluded the term.

("perception" OR "perceive*" OR "local perspective*" OR "awareness") AND ("climat* chang*" OR "global warming" OR "chang* climat*" OR "climat* variabilit*" OR "climat* event*") AND ("indigenous*" OR "smallholder*" OR "small scale*" OR "livelihood*") AND ("fisher*" OR "peasant*" OR "hunt*" OR "agricultur*" OR "forager*" OR "agropastoralist*" OR "horticultur*" OR "pastoralist*")*

When looking to improve the string, we deleted the term "perceive*", changed the term "hunt*" to "hunter*" and added "herder*". The search resulted in 856 publications in Scopus and 1,126 in WoS.

("perception" OR "local perspective*" OR "awareness") AND ("climat* chang*" OR "global warming" OR "chang* climat*" OR "climat* variabilit*" OR "climat* event*") AND ("indigenous*" OR "smallholder*" OR "small scale*" OR "livelihood*") AND ("fisher*" OR "peasant*" OR "hunter*" OR "agricultur*" OR "forager*" OR "agropastoralist*" OR "horticultur*" OR "pastoralist*" OR “herder*”)*

Search String nº 17

We realized that we should replace the Boolean character OR with AND, since we understood that the terms used were synonymous for small-scale population. Therefore, this was the string:

("perception" OR "local perspective*" OR "awareness") AND ("climat* chang*" OR "global warming" OR "chang* climat*" OR "climat* variabilit*" OR "climat* event*") AND ("indigenous*" OR "smallholder*" OR "small scale*" OR "livelihood*" OR "fisher*" OR "peasant*" OR "hunter*" OR "agricultur*" OR "forager*" OR "agropastoralist*" OR "horticultur*" OR "pastoralist*" OR “herder*”)*

As of May 2022, the search returned 3,695 publications in Scopus and 4,343 publications in WoS. When we apply the filter for articles in document type, we have 2,842 publications in Scopus and 3,813 in WoS. Further refining the search for English language and article in document type, we have 2,764 publications in Scopus and 3,773 in WoS.

Search String nº 18 (final string)

In July 2022, we realized that we did not include small-scale islanders. We added the term "small-island" to our string, which resulted in the final string:

("perception" OR "local perspective*" OR "awareness") AND ("climat* chang*" OR "global warming" OR "chang* climat*" OR "climat* variabilit*" OR "climat* event*") AND ("indigenous*" OR "smallholder*" OR "small scale*" OR "livelihood*" OR "fisher*" OR "peasant*" OR "hunter*" OR "agricultur*" OR "forager*" OR "agropastoralist*" OR "horticultur*" OR "pastoralist*" OR “herder*” OR “small-island*”)*

We refined the search for English language and article in document type, we have 2,886 publications in Scopus and 3,952 in WoS.

Additional comments

We adapted the search string for the BASE - Bielefeld Academic Search Engine, Science Direct Elsevier and PubMed databases, as it did not cover the same number of characters as Scopus and WoS. Therefore, the final string for the BASE, Science Direct Elservier, and PubMed was:

(("perception" OR "awareness") AND ("climate change" OR "global warming") AND ("indigenous" OR "smallholder" OR “small-island”))

Apêndice E - Lista teste com as 95 publicações de referência

'Test list' used to assess the comprehensiveness of the search string.

Column descriptions	
Author(s)	Author(s) of the article
Title	Title of the article
Publication Title	Journal where the article was published
Publication Year	Year of the article was published
Presence in WoS or Scopus or BASE	0=No / 1=Yes

Author	Title	Publication Title	Publication Year	Presence in WoS/Scopus/BASE
Koirala, P.; Kotani, K.; Managi, S.	How do farm size and perceptions matter for farmers' adaptation responses to climate change in a developing country? Evidence from Nepal	Economic Analysis and Policy	2022	1
Musafiri, C. M.; Kiboi, M.; Macharia, J.; Ng'etich, O. K.; Kosgei, D. K.; Mulianga, B. et al.	Smallholders' adaptation to climate change in Western Kenya: Considering socioeconomic, institutional and biophysical determinants.	Environmental Challenges	2022	1
Twecan, D.; Wang, W.; Xu, J.; Mohmmed, A.	Climate change vulnerability, adaptation measures, and risk perceptions at households level in Acholi sub-region, Northern Uganda.	Land Use Policy	2022	1
Antwi-Agyei, P.; Wiafe, E. A.; Amanor, K.; Baffour-Ata, F.; Codjoe, S. N. A.	Determinants of choice of climate change adaptation practices by smallholder pineapple farmers in the semi-deciduous forest zone of Ghana.	Environmental and Sustainability Indicators	2021	1
Asante, F.; Guodaar, L.; Arimiyaw, S.	Climate change and variability awareness and livelihood adaptive strategies among smallholder farmers in semi-arid northern Ghana.	Environmental Development	2021	1
Baffour-Ata, F.; Antwi-Agyei, P.; Nkiaka, E.	Climate variability, land cover changes and livelihoods of communities on the fringes of bobiri forest reserve, Ghana	Forests	2021	1
Ghazali, S.; Azadi, H.; Janečková, K.; Sklenička, P.; Kurban, A.; Cakir, S.	Indigenous knowledge about climate change and sustainability of nomadic livelihoods: understanding adaptability coping strategies.	Environment, Development and Sustainability	2021	1
Ghosh-Jerath, S.; Kapoor, R.; Ghosh, U.; Singh, A.; Downs, S.; Fanzo, J.	Pathways of Climate Change Impact on Agroforestry, Food Consumption Pattern, and Dietary Diversity Among Indigenous Subsistence Farmers of Sauria Paharia Tribal Community of India: A Mixed Methods Study	Frontiers in Sustainable Food Systems	2021	1
Guodaar, L.; Bardsley, D. K.; Suh, J.	Integrating local perceptions with scientific evidence to understand climate change variability in northern Ghana: A mixed-methods approach.	Applied Geography	2021	1
Mairura, F.S.; Musafiri, C.M.; Kiboi, M.N.; Macharia J.M.; Ng'etich O.K.; Shisanya C.A.; Okeyo J.M.; Mugendi D.N; Okwuosa, E.A.; Ngetich, F.K.	Determinants of farmers' perceptions of climate variability, mitigation, and adaptation strategies in the central highlands of Kenya	Weather and Climate Extremes	2021	1
Manh, N.T.; Ahmad, M.M.	Indigenous farmers' perception of climate change and the use of local knowledge to adapt to climate variability: A case study of Vietnam	Journal of International Development	2021	1
Mihiretu, A., Okoyo, E. N., & Lemma, T.	Causes, indicators and impacts of climate change: understanding the public discourse in Goat based agro-pastoral livelihood zone, Ethiopia.	Heliyon	2021	1
Mugi-Ngenga E.W.; Kiboi M.N.; Mucheru-Muna M.W.; Mugwe J.N.; Mairura F.S.; Mugendi D.N.; Ngetich F.K.	Indigenous and conventional climate-knowledge for enhanced farmers' adaptation to climate variability in the semi-arid agro-ecologies of Kenya	Environmental Challenges	2021	1
Nyang'au, J. O.; Mohamed, J. H.; Mango, N.; Makate, C.; Wangeci, A. N.	Smallholder farmers' perception of climate change and adoption of climate smart agriculture practices in Masaba South Sub-county, Kisii, Kenya.	Heliyon	2021	1
Ojo, T.O.; Ogundeji, A.A.; Belle, J.A.	Climate change perception and impact of on-farm demonstration on intensity of adoption of adaptation strategies among smallholder farmers in South Africa	Technological Forecasting and Social Change	2021	1
Owusu, V.; Ma, W.; Emuah, D.; Renwick, A.	Perceptions and vulnerability of farming households to climate change in three agro-ecological zones of Ghana.	Journal of Cleaner Production	2021	1
Assan, E.; Suvedi, M.; Olabisi, L. S.; Bansah, K. J.	Climate change perceptions and challenges to adaptation among smallholder farmers in semi-arid Ghana: A gender analysis.	Journal of Arid Environments	2020	1
Funk, C.; Sathyan, A. R.; Winker, P.; Breuer, L.	Changing climate-Changing livelihood: smallholder's perceptions and adaption strategies.	Journal of Environmental Management	2020	1
Hasan, M.K.; Kumar, L.	Perceived farm-level climatic impacts on coastal agricultural productivity in Bangladesh	Climatic Change	2020	1
Madhanagopal, D.; Pattanaik, S.	Exploring fishermen's local knowledge and perceptions in the face of climate change: the case of coastal Tamil Nadu, India	Environment, Development and Sustainability	2020	1
Makame, M.O.; Shackleton, S.	Perceptions of climate variability and change in relation to observed data among two east coast communities in Zanzibar, East Africa	Climate and Development	2020	1
Metcalfe, S. E.; Schmook, B.; Boyd, D. S.; la Barreda-Bautista, D.; Endfield, G. E.; Mardero, S. et al.	Community perception, adaptation and resilience to extreme weather in the Yucatan Peninsula, Mexico.	Regional Environmental Change	2020	1

Author	Title	Publication Title	Publication Year	Presence in WoS/Scopus/BASE
Mijiddorj, T. N.; Alexander, J. S.; Samelius, G.; Mishra, C.; Boldgiv, B.	Traditional livelihoods under a changing climate: herder perceptions of climate change and its consequences in South Gobi, Mongolia.	Climatic Change	2020	1
Ogra, M.; Manral, U.; Platt, R.V.; Badola, R.; Butcher, L.	Local perceptions of change in climate and agroecosystems in the Indian Himalayas: A case study of the Kedarnath Wildlife Sanctuary (KWS) landscape, India	Applied Geography	2020	1
Paudel, B.; Zhang, Y.; Yan, J.; Rai, R.; Li, L.; Wu, X. et al.	Farmers' understanding of climate change in Nepal Himalayas: Important determinants and implications for developing adaptation strategies.	Climatic change	2020	1
Sharma, A.; Batish, D. R.; Uniyal, S. K.	Documentation and validation of climate change perception of an ethnic community of the western Himalaya.	Environmental Monitoring and Assessment	2020	1
Ubisi, N. R.; Kolanisi, U.; Jiri, O.	The role of indigenous knowledge systems in rural smallholder farmers' response to climate change: case study of Nkomazi Local Municipality, Mpumalanga, South Africa.	Journal of Asian and African Studies	2020	1
Van Huynh, C.; Le, Q. N. P.; Nguyen, M. T. H.; Tran, P. T.; Nguyen, T. Q.; Pham, T. G. et al.	Indigenous knowledge in relation to climate change: adaptation practices used by the Xo Dang people of central Vietnam.	Heliyon	2020	1
Wang, T.; Yan, J.; Cheng, X.; Yu, Y.	Irrigation Influencing Farmers' Perceptions of Temperature and Precipitation: A Comparative Study of Two Regions of the Tibetan Plateau.	Sustainability	2020	1
Ado, A. M.; Leshan, J.; Savadogo, P.; Bo, L.; Shah, A. A.	Farmers' awareness and perception of climate change impacts: Case study of Aguie district in Niger.	Environment, Development and sustainability	2019	1
Ahmed, M. N. Q.; Haq, A.; Md, S.	Indigenous people's perceptions about climate change, forest resource management, and coping strategies: a comparative study in Bangladesh.	Environment, Development and Sustainability	2019	1
Asare-Nuamah, P.; Botchway, E.	Comparing smallholder farmers' climate change perception with climate data: the case of Adansi North District of Ghana.	Heliyon	2019	1
Córdova, R.; Hogarth, N.J.; Kanninen, M.	Mountain farming systems' exposure and sensitivity to climate change and variability: Agroforestry and conventional agriculture systems compared in Ecuador's Indigenous Territory of Kayambi people	Sustainability (Switzerland)	2019	1
Cuni-Sanchez, A.; Omeny, P.; Pfeifer, M.; Olaka, L.; Mamo, M. B.; Marchant, R.; Burgess, N. D.	Climate change and pastoralists: perceptions and adaptation in montane Kenya.	Climate and Development	2019	1
Funatsu, B. M.; Dubreuil, V.; Racapé, A.; Debortoli, N. S.; Nasuti, S.; Le Tourneau, F. M.	Perceptions of climate and climate change by Amazonian communities.	Global Environmental Change	2019	1
Hundera, H.; Mpandeli, S.; Bantider, A.	Smallholder farmers' awareness and perceptions of climate change in Adama district, central rift valley of Ethiopia.	Weather and Climate Extremes	2019	1
Jamshidi, O.; Asadi, A.; Kalantari, K.; Azadi, H.; Scheffran, J.	Vulnerability to climate change of smallholder farmers in the Hamadan province, Iran	Climate Risk Management	2019	1
Kahsay, H.T.; Guta, D.D.; Birhanu, B.S.; Gidey, T.G.; Routray, J.K.	Farmers' Perceptions of Climate Change Trends and Adaptation Strategies in Semiarid Highlands of Eastern Tigray, Northern Ethiopia	Advances in Meteorology	2019	1
Mafongoya, P.; Naidoo, D.; Sibanda, M.; Muringai, R. T.	Small-scale fishers' perceptions of climate change and its consequences on fisheries: the case of Sanyathi fishing basin, Lake Kariba, Zimbabwe.	Transactions of the Royal Society of South Africa	2019	1
Meena, R.K.; Vikas; Verma, T.P.; Yadav, R.P.; Mahapatra, S.K.; Surya, J.N.; Singh, D.; Singh, S.K.	Local perceptions and adaptation of indigenous communities to climate change: Evidences from high mountain pangi valley of Indian himalayas	Indian Journal of Traditional Knowledge	2019	1
Pondorfer, A.	The perception of climate change: Comparative evidence from the small-island societies of Bougainville and Palawan.	Environmental Development	2019	1
Sereenonchai, S.; Arunrat, N.	Fishers' decisions to adopt adaptation strategies and expectations for their children to pursue the same profession in Chumphon Province, Thailand	Climate	2019	1
Shukla, R.; Agarwal, A.; Sachdeva, K.; Kurths, J.; Joshi, P. K.	Climate change perception: an analysis of climate change and risk perceptions among farmer types of Indian Western Himalayas.	Climatic change	2019	1
Tume, S.J.P.; Kimengsi, J.N.; Fogwe, Z.N.	Indigenous knowledge and farmer perceptions of climate and ecological changes in the bamenda highlands of cameroon: Insights from the bui plateau	Climate	2019	1
Van Gevelt, T.; Abok, H.; Bennett, M. M.; Fam, S. D.; George, F.; Kulathuramaiyer, N. et al.	Indigenous perceptions of climate anomalies in Malaysian Borneo.	Global Environmental Change	2019	1
Vargas, C.A.C.; Romero, S.H.; Leon-Sicard, O.	Resilience to climate variability: the role of perceptions and traditional knowledge in the Colombian Andes	Agroecology and Sustainable Food Systems	2019	1
Zhang, Q.; Cui, F.; Dai, L.; Feng, B.; Lu, Y.; Tang , H.	Pastoralists' perception of and adaptation strategies for climate change: associations with observed climate variability	Natural Hazards	2019	1
Waldman, K.B.; Vergopolan, N.; Attari, S.Z.; Sheffield, J.; Estes, L.D.; Caylor, K.K.; Evans, T.P.	Cognitive biases about climate variability in smallholder farming systems in Zambia	Weather, Climate, and Society	2019	1
Wyllie de Echeverria, V. R.; Thornton, T. F.	Using traditional ecological knowledge to understand and adapt to climate and biodiversity change on the Pacific coast of North America.	Ambio	2019	1
Amare, Z.Y.	Indigenous knowledge of rural communities for combating climate change impacts in west central ethiopia	Journal of Agricultural Extension	2018	1
Ambrosio-Albala, P.; Delgado-Serrano, M. M.	Understanding climate change perception in community-based management contexts: perspectives of two Indigenous communities.	Weather, Climate, and Society	2018	1
Ayal, D.Y.; Radeny, M.; Desta, S.; Gebru, G.	Climate variability, perceptions of pastoralists and their adaptation strategies: Implications for livestock system and diseases in Borana zone	International Journal of Climate Change Strategies and Management	2018	1
Hasan, Z.; Nursey-Bray, M.	Artisan fishers' perception of climate change and disasters in coastal Bangladesh	Journal of Environmental Planning and Management	2018	1
Mekonnen, Z.; Kassa, H.; Woldeamanuel, T.; Asfaw, Z.	Analysis of observed and perceived climate change and variability in Arsi Negele District, Ethiopia.	Environment, Development and Sustainability	2018	1

Author	Title	Publication Title	Publication Year	Presence in WoS/Scopus/BASE
Mubiru, D. N.; Radeny, M.; Kyazze, F. B.; Zziwa, A.; Lwasa, J.; Kinyangi, J.; Mungai, C.	Climate trends, risks and coping strategies in smallholder farming systems in Uganda.	Climate Risk Management	2018	1
Nash, D.; Memmott, P.; Reser, J.; Suliman, S.	We're the same as the inuit!: Exploring Australian Aboriginal perceptions of climate change in a multidisciplinary mixed methods study.	Energy research & social science	2018	1
Pandey, R.; Kumar, P.; Archie, K.M.; Gupta, A.K.; Joshi, P.K.; Valente, D.; Petrosillo, I.	Climate change adaptation in the western-Himalayas: Household level perspectives on impacts and barriers	Ecological Indicators	2018	1
Tunde, A.M.; Ajadi, B.S.	Indigenous understanding of climate change, impacts and coping strategies in a rural setting of Kwara State, Nigeria	Geography, Environment, Sustainability	2018	1
Alam, G. M.; Alam, K.; Mushtaq, S.	Climate change perceptions and local adaptation strategies of hazard-prone rural households in Bangladesh	Climate Risk Management	2017	1
Ayanlade, A.; Radeny, M.; Morton, J. F.	Comparing smallholder farmers' perception of climate change with meteorological data: A case study from southwestern Nigeria.	Weather and climate extremes	2017	1
Hitayezu, P.; Wale, E.; Ortmann, G.	Assessing farmers' perceptions about climate change: A double-hurdle approach.	Climate Risk Management	2017	1
Singh, R. K., Zander, K. K., Kumar, S., Singh, A., Sheoran, P., Kumar, A., et al.	Perceptions of climate variability and livelihood adaptations relating to gender and wealth among the Adi community of the Eastern Indian Himalayas.	Applied Geography	2017	1
Uprety, Y.; Shrestha, U.B.; Rokaya, M.B.; Shrestha, S.; Chaudhary, R.P.; Thakali, A.; Cockfield, G.; Asselin, H.	Perceptions of climate change by highland communities in the Nepal Himalaya	Climate and Development	2017	1
Aryal, S.; Cockfield, G.; Maraseni, T. N.	Perceived changes in climatic variables and impacts on the transhumance system in the Himalayas	Climate and Development	2016	1
Herman-Mercer, N. M.; Matkin, E.; Laituri, M. J.; Toohey, R. C.; Massey, M.; Elder, K. et al.	Changing times, changing stories: generational differences in climate change perspectives from four remote indigenous communities in Subarctic Alaska.	Ecology and Society	2016	1
Kagunyu, A.; Wandibba, S.; Wanjohi, J. G.	The use of indigenous climate forecasting methods by the pastoralists of Northern Kenya.	Pastoralism	2016	0
Roder, G.; Ruljigaljig, T.; Lin, C. W.; Tarolli, P.	Natural hazards knowledge and risk perception of Wujie indigenous community in Taiwan.	Natural Hazards	2016	1
Shukla, G.; Kumar, A.; Pala, N. A.; Chakravarty, S.	Farmers perception and awareness of climate change: a case study from Kanchandzonga Biosphere Reserve, India.	Environment, development and sustainability	2016	1
Fernández-Llamazares, Á.; Méndez-López, M. E.; Díaz-Reviriego, I.; McBride, M. F.; Pyhälä, A.; Rosell-Melé, A.; Reyes-García, V.	Links between media communication and local perceptions of climate change in an indigenous society.	Climatic change	2015	1
Oyerinde, G. T.; Hountondji, F. C.; Wisser, D.; Diekkrüger, B.; Lawin, A. E.; Odofin, A. J.; Afouda, A.	Hydro-climatic changes in the Niger basin and consistency of local perceptions.	Regional Environmental Change	2015	1
Roco-Fuentes, L.; Engler, A.; Bravo-Ureta, B.; Jara-Rojas, R.	Farmers' perception of climate change in mediterranean Chile.	Regional Environmental Change	2015	1
Tesfaye, W.; Seifu, L.	Climate change perception and choice of adaptation strategies: Empirical evidence from smallholder farmers in east Ethiopia.	International Journal of Climate Change Strategies and Management	2015	1
Nkomwa, E. C.; Joshua, M. K.; Ngongondo, C.; Monjerezi, M.; Chipungu, F.	Assessing indigenous knowledge systems and climate change adaptation strategies in agriculture: A case study of Chagaka Village, Chikhwawa, Southern Malawi.	Physics and Chemistry of the Earth	2014	1
Rudiak-Gould, P.	The influence of science communication on indigenous climate change perception: theoretical and practical implications.	Human Ecology	2014	1
Smith Jr, W. J.; Liu, Z.; Safi, A. S.; Chief, K.	Climate change perception, observation and policy support in rural Nevada: A comparative analysis of Native Americans, non-native ranchers and farmers and mainstream America.	Environmental Science & Policy	2014	1
Boillat, S., Berkes, F.	Perception and interpretation of climate change among Quechua farmers of Bolivia: indigenous knowledge as a resource for adaptive capacity.	Ecology and Society	2013	1
MacDonald, J. P.; Harper, S. L.; Willox, A. C.; Edge, V. L.; Government, R. I. C.	A necessary voice: Climate change and lived experiences of youth in Rigolet, Nunatsiavut, Canada.	Global Environmental Change	2013	1
Dinero, S. C.	Indigenous perspectives of climate change and its effects upon subsistence activities in the Arctic: the case of the Nets' aii Gwich'in.	GeoJournal	2013	1
Gandure, S.; Walker, S.; Botha, J.J.	Farmers' perceptions of adaptation to climate change and water stress in a South African rural community	Environmental Development	2013	1
Huda, M.	Understanding indigenous people's perception on climate change and climatic hazards: a case study of Chakma indigenous communities in Rangamati Sadar Upazila of Rangamati District, Bangladesh.	Natural Hazards	2013	1
Simelton, E.; Quinn, C. H.; Batisani, N.; Dougill, A. J.; Dyer, J. C.; Fraser, E. D. et al.	Is rainfall really changing? Farmers' perceptions, meteorological data, and policy implications.	Climate and development	2013	1
Tambo, J. A.; Abdoulaye, T.	Smallholder farmers' perceptions of and adaptations to climate change in the Nigerian savanna	Regional Environmental Change	2013	1
Nzeadibe, T. C.; Egbule, C. L.; Chukwuone, N. A.; Agwu, A. E.; Agu, V. C.	Indigenous innovations for climate change adaptation in the Niger Delta region of Nigeria.	Environment, Development and Sustainability	2012	1
Silvestri, S.; Bryan, E.; Ringler, C.; Herrero, M.; Okoba, B.	Climate change perception and adaptation of agro-pastoral communities in Kenya.	Regional Environmental Change	2012	1
Chaudhary, P.; Bawa, K. S.	Local perceptions of climate change validated by scientific evidence in the Himalayas.	Biology Letters	2011	1

Author	Title	Publication Title	Publication Year	Presence in WoS/Scopus/BASE
Deressa, T. T.; Hassan, R. M.; Ringler, C.	Perception of and adaptation to climate change by farmers in the Nile basin of Ethiopia.	The Journal of Agricultural Science	2011	1
Kalanda-Joshua, M.; Ngongondo, C.; Chipeta, L.; Mpembeka, F.	Integrating indigenous knowledge with conventional science: Enhancing localised climate and weather forecasts in Nessa, Mulanje, Malawi.	Physics and Chemistry of the Earth	2011	1
Rao, K. P. C., Ndegwa, W. G., Kizito, K.; Oyoo, A.	Climate variability and change: Farmer perceptions and understanding of intra-seasonal variability in rainfall and associated risk in semi-arid Kenya.	Experimental agriculture	2011	1
Sánchez-Cortés, M. S.; Chavero, E. L.	Indigenous perception of changes in climate variability and its relationship with agriculture in a Zoque community of Chiapas, Mexico	Climatic change	2011	1
Marin, A.	Riders under storms: contributions of nomadic herders' observations to analysing climate change in Mongolia.	Global Environmental Change	2010	1
Orlove, B.; Roncoli, C.; Kabugo, M.; Majugu, A.	Indigenous climate knowledge in southern Uganda: the multiple components of a dynamic regional system.	Climatic change	2010	1
Bryan, E.; Deressa, T. T.; Gbetibouo, G. A.; Ringler, C.	Adaptation to climate change in Ethiopia and South Africa: options and constraints	Environmental science & policy	2009	1
Mertz, O.; Mbow, C.; Reenberg, A.; Diouf, A.	Farmers' perceptions of climate change and agricultural adaptation strategies in rural Sahel.	Environmental management	2009	1
Slegers, M. F.	"If only it would rain": Farmers' perceptions of rainfall and drought in semi-arid central Tanzania.	Journal of Arid Environments	2008	1
Meze-Hausken, E.	Contrasting climate variability and meteorological drought with perceived drought and climate change in northern Ethiopia.	Climate research	2004	1

Apêndice F - Lista completa de referências dos artigos selecionados para leitura na íntegra.

READ ME

Column descriptions	
Source	Database where the article was published (see codebook)
Title	Title of the article
Author(s)	Author(s) of the article
Journal	Journal where the article was published
Year	Year of the article was published
DOI	DOI of the article
Select	Was the article selected for full reading? 1=Yes
Disponible	Was the article available for full reading? 0=No 1=Yes 2 = Yes, but did not meet the eligibility criteria. Therefore, the article was not read and data collection was not performed.
Reason	What was the reason for not reading the full article? Note: n.a.=not available.

Source	Title	Author	Journal	Year	DOI	Select	Disponible	Reason
6	Effects of climate variability on livestock productivity and pastoralists perception: The case of drought resilience in Southeastern Ethiopia	Habte, M.; Eshetu, M.; Maryo, M.; Andualem, D.; Legesse, A.	Veterinary and Animal Science	2022	10.1016/j.vas.2022.100240	1	1	n.a.
6	How do farm size and perceptions matter for farmers' adaptation responses to climate change in a developing country? Evidence from Nepal	Koirala, P.; Kotani, K.; Managi, S.	Economic Analysis and Policy	2022	10.1016/j.eap.2022.01.014	1	1	n.a.
19	Smallholders' adaptation to climate change in Western Kenya: Considering socioeconomic, institutional and biophysical determinants	Musafiri, C.M.; Kiboi, M.; Macharia, J.; Ng'etich, O.K.; Kosgei, D.K.; Mulianga, B.; Okoti, M.; Ngetich, F.K.	Environmental Challenges	2022	10.1016/j.envc.2022.100489	1	1	n.a.
11	Climate change vulnerability, adaptation measures, and risk perceptions at households level in Acholi sub-region, Northern Uganda	Twecan, D.; Wang, W.; Xu, J.; Mohmmed, A.	Land Use Policy	2022	10.1016/j.landusepol.2022.106011	1	1	n.a.
6	Extreme hydroclimatic events in rural communities of the Brazilian Amazon: local perceptions of change, impacts, and adaptation	Almudi, T.; Sinclair, A.J.	Regional Environmental Change	2022	10.1007/s10113-021-01857-0	1	1	n.a.
6	Climate change perceptions, impacts and adaptation practices of fishers in southeast Bangladesh coast	Alam, E.; Mallick, B.	International Journal of Climate Change Strategies and Management	2022	10.1108/IJCCSM-02-2021-0019	1	1	n.a.
6	Indigenous local observations and experiences can give useful indicators of climate change in data-deficient regions	Chanza, N.; Musakwa, W.	Journal of Environmental Studies and Sciences	2022	10.1007/s13412-022-00757-x	1	1	n.a.
6	Local differentiation and adaptation to climate change in Coastal Ghana	Owusu, V.; Andriesse, E.	Geographical Review	2022	10.1080/00167428.2021.2023530	1	0	Not disponible (pay acess).
6	Risk, perception and adaptation to climate change: evidence from arid region, India	Singh, N.P.; Anand, B.; Srivastava, S. K.; Kumar, N.R.; Sharma, S.; Bal, S.K.; Rao, K.V.; Prabhakar, M.	Natural Hazards	2022	10.1007/s11069-022-05216-y	1	1	n.a.
6	Role of Homestead Forests in Adaptation to Climate Change: A Study on Households' Perceptions and Relevant Factors in Bandarban Hill District, Bangladesh	Baul, T.K.; Peuly, T.A.; Nandi, R.; Kar, S.; Karmakar, S.	Environmental Management	2022	10.1007/s00267-022-01598-8	1	1	n.a.
12	Living and Responding to Climatic Stresses: Perspectives from Smallholder Farmers in Hanang' District, Tanzania	Maliki, M.A.; Pauline, N.M.	Environmental Management	2022	10.1007/s00267-021-01588-2	1	1	n.a.
6	Awareness and perception of climate change by smallholder farmers in two agroecological zones of Oyo state Southwest Nigeria	Akano, O.; Modirwa, S.; Oluwasemire, K.; Oladele, O.	GeoJournal	2022	10.1007/s10708-022-10590-y	1	1	n.a.
6	Community perceptions of climate change and ecosystem-based adaptation in the mangrove ecosystem of the Rufiji Delta, Tanzania	Nyangoko, B.P.; Berg, H.; Mangora, M.M.; Shalli, M.S.; Gullström, M.	Climate and Development	2022	10.1080/17565529.2021.2022449	1	1	n.a.
6	The Relationship between Climate Change, Variability, and Food Security: Understanding the Impacts and Building Resilient Food Systems in West Pokot County, Kenya	Obwocha, E.B.; Ramisch, J.J.; Duguma, L.; Orero, L.	Sustainability (Switzerland)	2022	10.3390/su14020765	1	1	n.a.
6	Climate change perceptions and adaptations by indigenous Chepang community of Dhading, Nepal	Rai, S.; Dahal, B.; Anup, K.C.	GeoJournal	2022	10.1007/s10708-022-10577-9	1	1	n.a.
2	Factors Influencing Choice of Climate Change Adaptation Methods among Underutilized Indigenous Vegetable farmers	Ekemini-Richard, M.; Ayanwale, A.B.; Adelegan, O.J.	International Journal of Vegetable Science	2022	10.1080/19315260.2020.1848960	1	1	n.a.
6	Farmers' behaviors and attitudes toward climate change adaptation: evidence from Vietnamese smallholder farmers	Tiet, T.; To-The, N.; Nguyen-Anh, T.	Enviroment Development and Sustainability	2022	10.1007/s10668-021-02030-7	1	1	n.a.
6	Development of a regional climate change perception index based on traditional knowledge base of small-marginal farmers	Bhattacharjee, S; Das, JK; Roy, S; Chakrabarti, S	Indian Journal of Traditional Knowledge	2022		1	1	n.a.
1	Determinants of Farmers' Risk Perceptions of Hailstorms in Northern Bangladesh: Is Adaptive Capacity the Major Concern?	Raihan, M.L.; Basu, M.; Onitsuka, K.; Hoshino, S.	Polish Journal of Environmental Studies	2022	10.15244/pjoes/135699	1	1	n.a.
19	Climate change perception and local adaptation of natural resource management in a farming community of Cameroon: A case study	Chimi, P.M.; Mala, W.A.; Fobane, J.L.; Essouma, F.M.; II, J.A.M.; Funwi, F.P.; Bell, J.M.	Environmental Challenges	2022	10.1016/j.envc.2022.100539	1	1	n.a.
6	Climate change-induced livelihood adaptive strategies and perceptions of forest-dependent communities: The case of Inanda, KwaZulu-Natal, South Africa	Wale, E.; Nkoana, M.A.; Mkuna, E.	Trees, Forests and People	2022	10.1016/j.tfp.2022.100250	1	1	n.a.
6	Do farmers perceive climate change clearly? An analysis of meteorological data and farmers' perceptions in the sub-Himalayan West Bengal, India	Datta, P.; Behera, B.	Journal of Water and Climate Change	2022	10.2166/wcc.2022.058	1	1	n.a.
10	Climate Change Perceptions and Adaptations among Smallholder Farmers in the Mountains of Eastern Democratic Republic of Congo	Amani, R.K.; Riera, B.; Imani, G.; Batumike, R.; Zafra-Calvo, N.; Cuni-Sanchez, A.	Land	2022	10.3390/land11050628	1	1	n.a.
10	Farmers' Perception and Efficacy of Adaptation Decisions to Climate Change	Reddy, K.V.; Paramesh, V.; Arunachalam, V.; Das, B.; Ramasundaram, P.; Pramanik, M.; Sridhara, S.; Reddy, D.D.; Alataway, A.; Dewidar, A.Z.; Mattar, M.A.	Agronomy	2022	10.3390/agronomy12051023	1	1	n.a.
10	Livelihood Capitals, Income Inequality, and the Perception of Climate Change: A Case Study of Small-Scale Cattle Farmers in the Ecuadorian Andes	Torres, B.; Cayambe, J.; Paz, S.; Ayerve, K.; Heredia-R, M.; Torres, E.; Luna, M.; Toulkeridis, T.; García, A.	Sustainability (Switzerland)	2022	10.3390/su14095028	1	1	n.a.
6	An Assessment of Farmers' Perception and Adaptive Capacity for Climate Change	Chaudhary, H.; Mishra, K.	Indian Journal of Economics and Development	2022	10.35716/IJED/21264	1	1	n.a.
6	Climate Change Perceptions, Impacts and Adaptation Strategies: Insights of Fishers in Zambezi River Basin, Zimbabwe	Muringai, R.T.; Mafongoya, P.; Lottering, R.T.	Sustainability (Switzerland)	2022	10.3390/su14063456	1	1	n.a.

Source	Title	Author	Journal	Year	DOI	Select	Disponible	Reason
10	Agrobiodiversity and perceived climatic change effect on family farming systems in semiarid tropics of Kenya	Njeru, E.M.; Awino, R.O.; Kirui, K.C.; Koech, K.; Jalloh, A.A.; Muthini, M.	Open Agriculture	2022	10.1515/opag-2022-0099	1	1	n.a.
6	Assessment and adaptation strategies of climate change through the prism of farmers' perception: A case study	Kamruzzaman, M.; Rahman, A.T.M.S.; Basak, A.; Alam, J.; Das, J.	International Journal of Environmental Science and Technology	2022	10.1007/s13762-022-04254-0	1	1	n.a.
10	Cropping systems intensification and diversification: risk, vulnerability and adaptation in southwest coastal Bangladesh	Jamal, M.R.; Kristiansen, P.; Kabir, M.J.; Lobry de Bruyn, L.	International Journal of Sustainable Development and World Ecology	2022	10.1080/13504509.2022.2073615	1	0	Not disponible (pay acess).
6	Farmers' Perception and Adaptation Strategies to Climate Change in Central Mali	Amadou, T.; Falconnier, G.N.; Mamoutou, K.; Georges, S.; Alassane, B.A.; François, A.; Michel, G.; Benjamin, S.	Weather, Climate, and Society	2022	10.1175/WCAS-D-21-0003.1	1	1	n.a.
6	Do Local Perceptions of Climate Variability and Changes Correspond to Observed Climate Changes? A Comparative Study from Nepal as One of the Most Climate-Vulnerable Countries	Darjee, K.B.; Neupane, P.R.; Köhl, M.	Weather, Climate, and Society	2022	10.1175/WCAS-D-21-0081.1	1	0	Not disponible (pay acess).
6	Awareness and adaptations to climate change among the rural farmers in different agro-ecological zones of Tanzania	Mkonda, M.Y.	Management of Environmental Quality: An International Journal	2022	10.1108/MEQ-10-2021-0241	1	1	n.a.
10	Perception matters: an Indigenous perspective on climate change and its effects on forest-based livelihoods in the Amazon	Bauer, T.N.; de Jong, W.; Ingram, V.	Ecology and Society	2022	10.5751/ES-12837-270117	1	1	n.a.
2	Farmers' perception of climate change and gender sensitive perspective for optimised irrigation in a compound surface-ground water system	Dawit, M.; Dinka, M.O.; Halefom, A.	Journal of Water and Land Development	2022	10.24425/jwld.2022.140773	1	1	n.a.
6	Individual and community perceptions of climate change in Lower Mustang, Nepal	Bom, U.; Tiefenbacher, J.; Belbase, S.	Environment, Development and Sustainability	2022	10.1007/s10668-022-02291-w	1	1	n.a.
6	Analyzing farm households' perception and choice of adaptation strategies towards climate change impacts: a case study of vulnerable households in an emerging Asian region	Baloch, Z.A.; Tan, Q.; Fahad, S.	Environmental Science and Pollution Research	2022	10.1007/s11356-022-19895-4	1	1	n.a.
2	Understanding Maharashtra Coastal Community's Perceptions and Livelihood Resilience to Climate Change Using the Community Participatory Approach	Sharma, R.; Jagtap, S.; Rao, P.	International Journal of Climate Change: Impacts and Responses	2022	10.18848/1835-7156/CGP/v14i02/1-19	1	1	n.a.
2	Perceptions and adaptation strategies for climate change from small ruminant farmers in North-West Cameroon	Tendonkeng, F.; Arnaud, H.T.B.; Noumbissi, M.N.B.; Miégoué, E.; Sawa, C.; Essie, F.M.N.; Mboko, A.V.; Tovignon, G.Z.; Nde, A.N.; Tedonkeng, E.P.; Vargas-Bello-Pérez, E.	Tropical and Subtropical Agroecosystems	2022		1	1	n.a.
10	Indigenous Kinabatangan Perspectives on Climate Change Impacts and Adaptations: Factors Influencing Their Support and Participation	Pimid, M.; Nasir, M.R.M.; Scian, J.; Ahmad, A.G.; Mutalib, A.H.A.; Perijin, J.	Sustainability	2022	10.3390/su14116459	1	1	n.a.
10	Perceived Climate Change and Determinants of Adaptation Responses by Smallholder Farmers in Central Ethiopia	Megersa, G.G.; Jaleta, M.; Tesfaye, K.; Getnet, M.; Tana, T.; Lakew, B.	Sustainability	2022	10.3390/su14116590	1	1	n.a.
6	Perceptions and attitudes towards climate change in fishing communities of the Sudd Wetlands, South Sudan	Benansio, J.S.; Funk, S.M.; Lino, J.L.; Balli, J.J.; Dante, J.O.; Dendi, D.; Fa, J.E.; Luiselli, L.	Regional Environmental Change	2022	10.1007/s10113-022-01928-w	1	1	n.a.
6	Perceived impact of climate variability and change on livelihoods of smallholder farmers in Lesotho	Dick-Sagoe, C.; Hope, K.N.; Asare-Nuamah, P.	African Journal Of Science Technology Innovation & Development	2022	10.1080/20421338.2022.2058339	1	0	Not disponible (pay acess).
6	Assessment of Status of Climate Change and Determinants of People's Awareness to Climate-Smart Agriculture: A Case of Sarlahi District, Nepal	Adhikari, S.; Rawal, S.; Thapa, S.	Advances In Agriculture	2022	10.1155/2022/1556407	1	1	n.a.
1	When Ice Turns to Water: Forest Fires and Indigenous Settlements in the Republic of Sakha (Yakutia)	Vinokurova, L.; Solovyeva, V.; Filippova, V.	Sustainability	2022	10.3390/su14084759	1	1	n.a.
1	Farmers' Perceptions about Irrigation Roles in Climate Change Adaptation and Determinants of the Choices to WUE-Improving Practices in Southern Ethiopia	Chinasho, A.; Bedadi, B.; Lemma, T.; Tana, T.; Hordofa, T.; Elias, B.	Air Soil And Water Research	2022	10.1177/11786221221092454	1	2	This study explored (1) farmers' perceptions about the roles of irrigation in climate change adaptation and (2) determinants of the choices to selected WUE-improving soil and water management practices in southern Ethiopia.
8	Dietary and agricultural adaptations to drought among smallholder farmers in South Africa: A qualitative study	Hawkins, P.; Geza, W.; Mabhaudhi, T.; Sutherland, C.; Queenan, K.; Dangour, A.; Scheelbeek, P.	Weather And Climate Extremes	2022	10.1016/j.wace.2022.100413	1	2	This research aimed to qualitatively investigate coping and adaptive strategies adopted by smallholder farming households to respond to the impacts of drought in rural KwaZulu-Natal, South Africa.
1	Exploring fishers' perceptions of index insurance and coral reef health in the context of climate-driven changes in extreme events	Maltby, K.M.; Acosta, L.; Townhill, B.; Touza, J.; White, P.; Mangi, S.C.	Ices Journal Of Marine Science	2022	10.1093/icesjms/fsac003	1	2	Location: Grenada in the Caribbean.
1	Local Knowledge of Coastal Population to Sea Level Rise and Climate Change - A Case Study in Fishermen Community, Kanyakumari District, Tamil Nadu, India	Veeran, Y.; Bose, R.S.J.; Kandasamy, S.	Journal Of Climate Change	2022	10.3233/JCC220011	1	0	Not disponible (pay acess).
19	Traditional village roles and gender shape Samoan perceptions of climate change	Cassinat, J.; Cassinat, K. C; Segi, T.; Tavana, N.G.; Gill, R. A.	Current Research in Environmental Sustainability	2022	10.1016/j.crsust.2022.100173	1	1	n.a.
3	Perception of transhumant herders on climate change and their adaptation strategies	Neupane, M.; Joshi, R.; Bhandari, D.; Awasthi, N.	Nature Conservation and Health Care Council	2022	10.3126/on.v20i1.43578	1	1	n.a.
3	Determinants of Smallholder Farmers' Adaptation to Climate Change and Variability: The Case Study of Sire District, Arsi Zone, Oromia National Regional State, Ethiopia	Kasim, M.; Feto, A.	Arsi Journal of Science and Innovation	2022	10.20372/ajsi.v3i1.3150	1	2	Location: Sire is a town in Ethiopia.

Source	Title	Author	Journal	Year	DOI	Select	Disponible	Reason
11	Livelihood and production strategies of livestock keepers and their perceptions on climate change in the Central Peruvian Andes	Radolf, M.;.Wurzinger, M.; Gutiérrez, G.	Small Ruminant Research	2022	10.1016/j.smallrumres.2022.106763	1	1	n.a.
6	Agro-pastoralists' perception of climate change and adaptation in the Qilian Mountains of northwest China	Xie, S.; Ding, W.; Ye, W.; Deng, Z.	Scientific Reports	2022	10.1038/s41598-022-17040-2	1	1	n.a.
6	Livelihood vulnerability assessment and climate change perception analysis in Arunachal Pradesh, India	Rehman, S.; Azhoni, A.; Chabbi, P.H.	GeoJournal	2022	10.1007/s10708-022-10703-7	1	1	n.a.
6	Farmers' perceptions of climate change in Lower Mustang, Nepal	Hamal, R.; Thakuri, B.M.; Poudel, K.R.; Gurung, A.; Yun, S.J.	Environmental Monitoring and Assessment	2022	10.1007/s10661-022-10286-3	1	1	n.a.
10	Ecological and Hydrological Indicators of Climate Change Observed by Dryland Communities of Malipati in Chiredzi, Zimbabwe	Chanza, N.; Musakwa, W.	Diversity	2022	10.3390/d14070541	1	1	n.a.
2	Impact of climate change on agricultural production: A case of Rasuwa District, Nepal	Dawadi, B.; Shrestha, A.; Acharya, R.H.; Dhital, Y.P.; Devkota, R.	Regional Sustainability	2022	10.1016/j.regsus.2022.07.002	1	1	n.a.
2	Changing Climatic Conditions and Shrinking Agricultural Land: A Community Based Study in Betalghat Development Block, Kumaun Lesser Himalaya	Kevla, N.; Tiwari, P.C.; Dheeraj, P.; Rahul, K.	Disaster Advances	2022	10.25303/1506da01010	1	1	n.a.
6	Spatiotemporal Changes in Mean and Extreme Climate: Farmers' Perception and Its Agricultural Implications in Awash River Basin, Ethiopia	Damtew, A.; Teferi, E.; Ongoma, V.; Mumo, R.; Esayas, B.	Climate	2022	10.3390/cli10060089	1	1	n.a.
6	What affects farmers in choosing better agroforestry practice as a strategy of climate change adaptation? An experience from the mid-hills of Nepal	Paudel, D.; Tiwari, K.R.; Raut, N.; Bajracharya, R.M.; Bhattarai, S.; Sitaula, B.K.; Thapa, S.	Heliyon	2022	10.1016/j.heliyon.2022.e09695	1	1	n.a.
6	Farmers' Perception of Climate Change and Climate-Smart Agriculture in Northern Benin, West Africa	Moutouama, F.T.; Tepa-Yotto, G.T.; Agboton, C.; Gbaguidi, B.; Sekabira, H.; Tamò, M.	Agronomy	2022	10.3390/agronomy12061348	1	1	n.a.
6	Climate change adaptation and adaptive efficacy in the inland fisheries of the Lake Victoria basin	Nyboer, E.A.; Musinguzi L.; Ogutu-Ohwayo, R.; Natugonza, V.; Cooke ,S.J.; Young, N.; Chapman, L.J.	People and Nature	2022	10.1002/pan3.10388	1	1	n.a.
10	Safeguarding Indigenous Heritage in the Chilean Atacama Desert: Negotiating Identity Claims and Community Perceptions of Long-term Climate Change	Haboucha, R.; Jofré, D.	Heritage and Society	2022	10.1080/2159032X.2022.2110375	1	0	Not disponible (pay acess).
6	Gendered Vulnerability, Perception and Adaptation Options of Smallholder Farmers to Climate Change in Eastern Ethiopia	Maja, M.M.; Idiris, A.A.; Terefe, A.T.; Fashe, M.M.	Earth Systems and Environment	2022	10.1007/s41748-022-00324-y	1	0	Not disponible (pay acess).
6	Perceived influence of climate variability in the context of multiple stressors on smallholder farmers in southern Mexico	Leroy, D.; García, S.B.; Bocco, G.	Climate and Development	2022	10.1080/17565529.2022.2092439	1	0	Not disponible (pay acess).
6	Indigenous knowledge indicators employed by farmers for adaptation to climate change in rural South Africa	Kom, Z.; Nethengwe, N.S.; Mpandeli, S.; Chikoore, H.	Journal of Environmental Planning and Management	2022	10.1080/09640568.2022.2086854	1	1	n.a.
6	Climate Variability in the Sudanian Zone of Cote d'Ivoire: Weather Observations, Perceptions, and Adaptation Strategies of Farmers	Timite, N.; Kouakou, A.T.M.; Bamba, I.; Barima, Y.S.S.; Bogaert, J.	Sustainability	2022	10.3390/su141610410	1	1	n.a.
6	Farmers' Risk Perception on Climate Change: Transhumance vs. Semi-Intensive Sheep Production Systems in Turkiye	Yetisgin, S.O.; Onder, H.; Sen, U.; Piwczynski, D.; Kolenda, M.; Sitkowska, B.; Yucel, C.	Animals	2022	10.3390/ani12151992	1	1	n.a.
6	Effects of climate change on pastoral households in the Harshin District of the Somali Region, Ethiopia	Abrham, T..; Mekuyie, M.	Jamba-Journal of Disaster Risk Studies	2022	10.4102/jamba.v14i1.1202	1	1	n.a.
6	Exploring climate change trends in major river basins and its impact on the riverine ecology, fish catch and fisheries of the Peninsular region of India: issues and a brief overview	Panikkar, P.; Sarkar, U.K.; Das, B.K.	Journal of Water and Climate Change	2022	10.2166/wcc.2022.054	1	1	n.a.
6	Social and ecological climate change vulnerability assessment in the Indus delta, Pakistan	Solangi, G.S.; Siyal, A.A.; Siyal, Z.-U.-A.; Siyal, P.; Panhwar, S.; Keerio, H.A.; Bhatti, N.B.	Water Practice and Technology	2022	10.2166/wpt.2022.087	1	1	n.a.
6	Changes in coastal farming systems in a changing climate in Bangladesh	Hasan, M.K.; Kumar, L.	Regional Environmental Change	2022	10.1007/s10113-022-01962-8	1	1	n.a.
2	Evolving farm-level adaptation to climate variability and change risks in the forest-savanna transitional zone of Ghana	Guodaar L.; Appiah D.O.	Environmental Challenges	2022	10.1016/j.envc.2022.100654	1	1	n.a.
16	Indigenous perceptions and adaptive responses to the impacts of climate variability in the Sierra Nevada de Santa Marta, Colombia	Guáqueta-Solórzano V.-E.; Postigo J.C.	Frontiers in Climate	2022	10.3389/fclim.2022.910294	1	1	n.a.
10	Smallholder farmers' behavioral preferences under the impact of climate change: A comparative analysis of two agricultural areas in China	Peng Y.; Xu Z.; Wei P.; Cheng L.	Frontiers in Earth Science	2022	10.3389/feart.2022.1010733	1	1	n.a.
10	Observed climate trends, perceived impacts and community adaptation practices in Côte d'Ivoire	Kouassi J.-L.; Wandan N.; Mbow C.	Environmental and Socio-Economic Studies	2022	10.2478/environ-2022-0016	1	1	n.a.
6	Integrated Farming Systems as an Adaptation Strategy to Climate Change: Case Studies from Diverse Agro-Climatic Zones of India	Paramesh V.; Kumar P.; Shamim M.; Ravisankar N.; Arunachalam V.; Nath A.J.; Mayekar T.; Singh R.; Prusty A.K.; Rajkumar R.S.; Panwar A.S.; Reddy V.K.; Pramanik M.; Das A.; Manohara K.K.; Babu S.; Kashyap P.	Sustainability (Switzerland)	2022	10.3390/su141811629	1	1	n.a.
2	Perception of Cassava-Based Farmers to Climate Variability in the Rain Forest and Derived Savannah Biomes of Nigeria	Ayinde A.F.O.; Johnston P.A.; Olujimi O.O.; Dasgupta P.; Akerele D.	Sarhad Journal of Agriculture	2022	10.17582/journal.sja/2022/38.5.43.52	1	1	n.a.
6	Local perception of climate change and adaptation in the highlands of Cameroon	Bruckmann L.; Lekane Tsobgou D.; Marcoty P.; Schmitz S.	African Geographical Review	2022	10.1080/19376812.2022.2144918	1	0	Not disponible (pay acess).

Source	Title	Author	Journal	Year	DOI	Select	Disponible	Reason
6	Past experience of drought, drought risk perception, and climate mitigation and adaptation decisions by farmers in New Zealand	Nguyen T.M.; Stahlmann-Brown P.; Noy I.	Environmental Hazards	2022	10.1080/17477891.2022.2141179	1	0	Not disponible (pay acess).
12	Artisanal fishers in small island developing states and their perception of environmental change: the case study of Mauritius	Appadoo C.; Sultan R.; Simier M.; Tandrayen-Ragoobur V.; Capello M.	Reviews in Fish Biology and Fisheries	2022	10.1007/s11160-022-09735-6	1	1	n.a.
10	Smallholder farmers' perceptions and adaptation strategies to climate change risks in northwest Ethiopia	Likinaw A.; Bewket W.; Alemayehu A.	International Journal of Climate Change Strategies and Management	2022	10.1108/IJCCSM-01-2022-0001	1	1	n.a.
2	Rural households' perceptio of climate change in the Central and North Gondar Zones, Northwest Ethiopia	Awoke W.; Agitew G.	African Journal of Food, Agriculture, Nutrition and Development	2022	10.18697/ajfand.113.19400	1	1	n.a.
10	Smallholder farmers' perception of climate change and choice of adaptation strategies in East Hararghe Zone, Eastern Ethiopia	Zeleke T.; Beyene F.; Deressa T.; Yousuf J.; Kebede T.	International Journal of Climate Change Strategies and Management	2022	10.1108/IJCCSM-01-2022-0014	1	1	n.a.
10	Effect of indigenous and scientific forecasts on pastoralists' climate change perceptions in the Rwenzori region, Western Uganda	Nkuba M.R.; Chanda R.; Mmopelwa G.; Kato E.; Najjingo Mangheni M.; Lesolle D.; Mujuni G.	Climate and Development	2022	10.1080/17565529.2022.2119831	1	1	n.a.
6	Awareness, Knowledge and Perception of Forest Dependent Communities on Climate Change in Malawi: A Case of Mchinji and Phirilongwe Forest Reserves in Malawi	Chisale H.L.W.; Chirwa P.W.; Babalola F.D.	Journal of Sustainable Forestry	2022	10.1080/10549811.2022.2123353	1	0	Not disponible (pay acess).
2	Climate Change Vulnerability Assessment in Mangrove-Dependent Communities of Manoka Island, Littoral Region of Cameroon	Fongnzossie E.; Sonwa D.J.; Mbevo P.; Kentatchime F.; Mokam A.; Tatuebu Tagne C.; Rim L.F.E.A.	Scientific World Journal	2022	10.1155/2022/7546519	1	2	Manoka is a small island town located in the Littoral Region of Cameroon at 3° 47′27.69″N and 9°36′45.78″E (Figure 1) and is the headquarters of the newly created Douala 6 subdivision.
1	A gendered perspective on climate change adaptation strategies: a case study from Yunnan, China	Sujakhu, NM; Ranjitkar, S; Su, YF; He, J; Xu, JC	Local Environment	2022	10.1080/13549839.2022.2130883	1	0	Not disponible (pay acess).
1	Does climate knowledge act as a shield for farm livelihoods? Empirical analysis from the coastal and non-coastal ecosystems of India	Das, U; Ansari, MA; Ghosh, S	Theoretical and Applied Climatology	2022	10.1007/s00704-022-04245-8	1	1	n.a.
27	Climate Change Impacts Can Be Differentially Perceived Across Time Scales: A Study Among the Tuareg of the Algerian Sahara	Miara MD, Negadi M, Tabak S, Bendif H, Dahmani W, Ait Hammou M, Sahnoun T, Snorek J, Porcher V, Reyes-García V, Teixidor-Toneu I.	Geohealth	2022	10.1029/2022GH000620	1	1	n.a.
3	Climate Change Impact on Indigenous Food Resources	Rankoana, S.A.	International Journal of Social Science Research and Review	2022	10.47814/ijssrr.v5i10.713	1	1	n.a.
3	Small-holder farmers knowledge and information on the impact of climate variability & extremes on livestock production in Limpopo & Mpumalanga Provinces.	Nesamvuni, A. E.; Ndwambi, K.; Tshikolomo, K. A; Lekalakala, G. R.; Raphulu, T.; Petja, B. M.; Van Niekerk, J.	Technium Social Sciences Journal	2022	10.47577/tssj.v27i1.5299	1	1	n.a.
16	Associating farmers' perception of climate change and variability with historical climate data	Ezeh, J. O.; Madukwe, E. U.; Ezeh, C. U.	Journal of Agricultural Sciences	2022	10.2298/JAS2203299E	1	1	n.a.
3	Farmers' perceptions of climate change, long-term variability and trends in rainfall in Apac district, northern Uganda	Atube, F.; Malinga, G.M.; Nyeko, M.; Okello, D.M.; Mugonola, B.; Omony, G.W.; Okello-Uma, I.	CABI Agriculture and Bioscience	2022	10.1186/s43170-022-00116-4	1	1	n.a.
2	Misalignment of perceptions with records and resources for responding to climate change risk	Kannan, S.; Bessette, D.L.; Abidoye, B.	Frontiers in Climate	2022	10.3389/fclim.2022.1038320	1	1	n.a.
31	Knowledge of climate change and adaptation by smallholder farmers: evidence from southern Ethiopia	Belay A.; Oludhe C.; Mirzabaev A.; Recha J.W.; Berhane Z.; Osano P.M.; Demissie T.; Olaka L.A.; Solomon D.	Heliyon	2022	10.1016/j.heliyon.2022.e12089	1	1	n.a.
20	Livestock farmers' perception of climate change and adaptation strategies in the Gera district, Jimma zone, Oromia Regional state, southwest Ethiopia	Abazinab H.; Duguma B.; Muleta E.	Heliyon	2022	10.1016/j.heliyon.2022.e12200	1	1	n.a.
6	Climate Change Perceptions and Adaptation Strategies: A Mixed Methods Study with Subsistence Farmers in Rural Peru	Landaverde R.; Rodriguez M.T.; Niewoehner-Green J.; Kitchel T.; Chuquillanqui J.	Sustainability (Switzerland)	2022	10.3390/su142316015	1	1	n.a.
2	Understanding Multidirectional Climate Change Impacts on Local Livelihoods through the Lens of Local Ecological Knowledge: A Study in Western Amazonia	Estevo M.D.O.; Junqueira A.B.; Reyes-García V.; Campos-Silva J.V.	Society and Natural Resources	2022	10.1080/08941920.2022.2153294	1	1	n.a.
2	Climate Variability Patterns and Farmers' Perceptions of Its Impact on Food Production: A Case Study of the Gelda Watershed in the Lake Tana Basin in Northwest Ethiopia	Anteneh M.	Air, Soil and Water Research	2022	10.1177/11786221221135093	1	1	n.a.
1	Climate change and the Western Himalayan community: Exploring the local perspective through food choices	Das, S; Mishra, AJ	Ambio	2022	10.1007/s13280-022-01810-3	1	1	n.a.
1	Impacts of Climate Change on the Lives of Riverine Farmers on the Lower Rio Negro, Amazon	de Vasconcelos, MA; Pereira, HD; Lopes, M; Guimaraes, DFD	Atmosphere	2022	10.3390/atmos13111906	1	1	n.a.
3	Climate Change Awareness and Indigenous Knowledge Systems and Practices (Iksp) of Riverine Fishers in the Nabaoy River, Malay, Aklan, Philippines: Linking Local Social Capital to Socio-Ecological Resilience Amidst the Changing Environment and Climate	Maliao, R. J.; Cahilig, R. C.; Cahilig, R. R.; Jaspe, B. T.	Malay, Aklan, Philippines: Linking Local Social Capital to Socio-Ecological Resilience Amidst the Changing Environment and Climate.	2022	10.2139/ssrn.4034376	1	1	n.a.
6	Trends of rainfall onset, cessation, and length of growing season in northern ghana: Comparing the rain gauge, satellite, and farmer's perceptions	Atiah, W.A.; Muthoni, F.K.; Kotu, B.; Kizito, F.; Amekudzi, L.K.	Atmosphere	2021	10.3390/atmos12121674	1	1	n.a.
2	Assessment of farm households' perception, beliefs and attitude toward climatic risks: A case study of rural Vietnam	Nguyen-Thi-Lan, H.; Fahad, S.; Nguyen-Anh, T.; Tran-Thi-Thu H.; Nguyen-Hong,	PLoS ONE	2021	10.1371/journal.pone.0258598	1	1	n.a.

Source	Title	Author	Journal	Year	DOI	Select	Disponible	Reason
		C.; To-The, N.						
6	Assessing farmers' typologies of perception for adopting sustainable adaptation strategies in bangladesh	Islam, A.R.M.T.; Hasanuzzaman, M.; Jaman, M.; Alam E.; Mallick J.; Monirul Alam G.M; Sattar, M.A.; Techato, K.	Climate	2021	10.3390/cli9120167	1	1	n.a.
2	Indigenous and conventional climate-knowledge for enhanced farmers' adaptation to climate variability in the semi-arid agro-ecologies of Kenya	Mugi-Ngenga E.W.; Kiboi M.N.; Mucheru-Muna M.W.; Mugwe J.N.; Mairura F.S.; Mugendi D.N.; Ngetich F.K.	Environmental Challenges	2021	10.1016/j.envc.2021.100355	1	1	n.a.
6	Climate change impacts on nomadic herders' livelihoods and pastureland ecosystems: a case study from Northeast Mongolia	Tugjamba, N.; Walkerden, G.; Miller, F.	Regional Environmental Change	2021	10.1007/s10113-021-01829-4	1	1	n.a.
11	Constraints for adopting climate-smart agricultural practices among smallholder farmers in Southeast Kenya	Autio, A.; Johansson, T.; Motaroki, L.; Minoia, P.; Pellikka, P.	Agricultural Systems	2021	10.1016/j.agsy.2021.103284	1	1	n.a.
6	Changes in the environment from perspectives of small-scale farmers in remote Vietnam	Nguyen-Anh, T.; Nong, D.; Leu, S.; To-The, N.	Regional Environmental Change	2021	10.1007/s10113-021-01835-6	1	1	n.a.
6	Fisher's perceptions inform adaptation measures to reduce vulnerability to climate change in a Mexican natural protected area	Salvadeo, C.; Morzaria-Luna, H.N.; Reyes-Bonilla, H.; Ivanova-Bonchera A.; Ramírez, D.P.; Juárez-León, E.	Marine Policy	2021	10.1016/j.marpol.2021.104793	1	1	n.a.
6	Determinants of farmers' perceptions of climate variability, mitigation, and adaptation strategies in the central highlands of Kenya	Mairura, F.S.; Musafiri, C.M.; Kiboi, M.N.; Macharia J.M.; Ng'etich O.K.; Shisanya C.A.; Okeyo J.M.; Mugendi D.N; Okwuosa, E.A.; Ngetich, F.K.	Weather and Climate Extremes	2021	10.1016/j.wace.2021.100374	1	1	n.a.
6	Examining local perspectives on the influence of climate change on the health of Hamer pastoralists and their livestock in Ethiopia	Lumborg, S.; Tefera, S.; Munslow, B.; Mor, S.M.	Pastoralism	2021	10.1186/s13570-021-00191-8	1	1	n.a.
2	Agricultural community-based impact assessment and farmers' perception of climate change in selected Ecological Zones in Nigeria	Oluwatimilehin, I.A.; Ayanlade, A.	Agriculture and Food Security	2021	10.1186/s40066-020-00275-5	1	1	n.a.
16	Adapting to Climate Change Through Conservation Agriculture: A Gendered Analysis of Eastern Zambia	Umar, B.B.	Frontiers in Sustainable Food Systems	2021	10.3389/fsufs.2021.748300	1	1	n.a.
10	Assessment of smallholder farmers' perception and adaptation response to climate change in the olifants catchment, South Africa	Olabanji, M.F.; Davis, N.; Ndarana, T.; Kuhudzai, A.G.; Mahlobo, D.	Journal of Water and Climate Change	2021	10.2166/wcc.2021.138	1	1	n.a.
2	Perception and adaptation of pastoralists to climate variability and change in Morocco's arid rangelands	Snaibi, W.; Mezrhab, A.; Sy, O.; Morton, J.F.	Heliyon	2021	10.1016/j.heliyon.2021.e08434	1	1	n.a.
6	Perceived effects of climate change and extreme weather events on forests and forest-based livelihoods in Malawi	Chisale, H.L.W.; Chirwa, P.W.; Babalola, F.D.; Manda, S.O.M.	Sustainability (Switzerland)	2021	10.3390/su132111748	1	1	n.a.
10	Smallholder farmers' perceived climate-related risk, impact, and their choices of sustainable adaptation strategies	Mamun, A.A.; Roy, S.; Islam, A.R.M.T.; Monirul Alam G.M.; Alam E.; Pal S.C.; Sattar, M.A.; Mallick, J.	Sustainability (Switzerland)	2021	10.3390/su132111922	1	1	n.a.
11	Climate change perception and impact of on-farm demonstration on intensity of adoption of adaptation strategies among smallholder farmers in South Africa	Ojo, T.O.; Ogundeji, A.A.; Belle, J.A.	Technological Forecasting and Social Change	2021	10.1016/j.techfore.2021.121031	1	1	n.a.
10	Smallholder farmers' perception of climate change and drivers of adaptation in agriculture: A case study in Guinea	Ceci, P.; Monforte, L.; Perelli, C.; Cicatiello C.; Branca G.; Franco S.; Diallo F.B.S.; Blasi, E.; Scarascia Mugnozza, G.	Review of Development Economics	2021	10.1111/rode.12815	1	1	n.a.
6	Indigenous knowledge about climate change and sustainability of nomadic livelihoods: understanding adaptability coping strategies	Ghazali, S.; Azadi, H.; Janečková, K.; Sklenička P.; Kurban, A.; Cakir, S.	Environment, Development and Sustainability	2021	10.1007/s10668-021-01332-0	1	1	n.a.
6	How local communities attribute livelihood vulnerabilities to climate change and other causes: a case study in North Vanuatu	Nef, D.P.; Neneth, D.; Dini, P.; Abad, C.R.; Kruetli, P.	Climatic Change	2021	10.1007/s10584-021-03221-x	1	1	n.a.
6	Adaptation Measures to Climate Change as Perceived by Smallholder Farmers in the Andes	Ballesteros, J.; Isaza, C.	Journal of Ethnobiology	2021	10.2993/0278-0771-41.3.428	1	1	n.a.
6	Perceptions, vulnerability and adaptation strategies for mitigating climate change effects among small livestock herders in Punjab, Pakistan	Faisal, M.; Abbas, A.; Cai, Y.; Ali A.; Shahzad M.A.; Akhtar S.; Raza M.H.; Ajmal M.A.; Xia C.; Sattar, S.A.; Batool, Z.	International Journal of Environmental Research and Public Health	2021	10.3390/ijerph182010771	1	1	n.a.
6	Vulnerability of small-scale farmers in relation to climate change and their coping strategies: Case study of southern punjab, pakistan	Luqman, M.; Mehmmod, M.U.; Ashraf, S.; Yaseen, M.; Ashraf, I.	Journal of Animal and Plant Sciences	2021	10.36899/JAPS.2021.5.0341	1	1	n.a.
10	Local perceptions of climate change and adaptation responses from two mountain regions in tanzania	Kaganzi, K.R.; Cuni-Sanchez, A.; McHarazo, F.; Martin, E.H.; Marchant, R.A.; Thorn, J.P.R.	Land	2021	10.3390/land10100999	1	1	n.a.
10	Indigenous farmers' perception of climate change and the use of local knowledge to adapt to climate variability: A case study of Vietnam	Manh, N.T.; Ahmad, M.M.	Journal of International Development	2021	10.1002/jid.3573	1	1	n.a.
6	Women smallholder farmers off-farm adaptation strategies to climate variability in rural Savannah, Ghana	Yiridomoh, G.Y.; Appiah, D.O.; Owusu, V.; Bonye, S.Z.	GeoJournal	2021	10.1007/s10708-020-10191-7	1	1	n.a.
6	How do farmers' perceptions of climate variability and change match or and mismatch climatic data? Evidence from North-west Ghana	Dakurah, G.	GeoJournal	2021	10.1007/s10708-020-10194-4	1	1	n.a.
6	Perceived links between climate change and weather forecast accuracy: new barriers to tools for agricultural decision-making	Guido, Z.; Lopus, S.; Waldman, K.; Hannah, C.; Zimmer, A.; Krell, N.; Knudson, C.; Estes, L.; Caylor, K.; Evans, T.	Climatic Change	2021	10.1007/s10584-021-03207-9	1	1	n.a.
26	Climate change and variability awareness and livelihood adaptive strategies among smallholder farmers in semi-arid northern Ghana	Asante, F.; Guodaar, L.; Arimiyaw, S.	Environmental Development	2021	10.1016/j.envdev.2021.100629	1	1	n.a.

Source	Title	Author	Journal	Year	DOI	Select	Disponible	Reason
6	Ethnic minority farmers' perceptions and use of local knowledge to adapt to climate change: Some insights from Vietnam	Manh, N.T.; Ahmad, M.M.	Singapore Journal of Tropical Geography	2021	10.1111/sjtg.12397	1	1	n.a.
10	Smallholder farmers' perceptions of climate change and adaptation practices for maize production in eastern Ethiopia	Teshome, H.; Tesfaye, K.; Dechassa, N.; Tana, T.; Huber, M.	Sustainability (Switzerland)	2021	10.3390/su13179622	1	1	n.a.
6	Land-use and climate related drivers of change in the reindeer management system in Finland: Geography of perceptions	Rasmus, S.; Wallen, H.; Turunen, M.; Landauer, M.; Tahkola, J.; Jokinen, M.; Laaksonen, S.	Applied Geography	2021	10.1016/j.apgeog.2021.102501	1	1	n.a.
6	Linking risk preferences and risk perceptions of climate change: A prospect theory approach	Villacis, A.H.; Alwang, J.R.; Barrera, V.	Agricultural Economics (United Kingdom)	2021	10.1111/agec.12659	1	1	n.a.
6	Time-series trend analysis and farmer perceptions of rainfall and temperature in northwestern Ethiopia	Marie, M.; Yirga, F.; Haile, M.; Ehteshammajd, S.; Azadi, H.; Scheffran, J.	Environment, Development and Sustainability	2021	10.1007/s10668-020-01192-0	1	1	n.a.
6	Are perception and adaptation to climate variability and change of cowpea growers in Mali gender differentiated?	Diarra, F.B.; Ouédraogo, M.; Zougmoré, R.B.; Partey, S.T.; Houessionon, P.; Mensah, A.	Environment, Development and Sustainability	2021	10.1007/s10668-021-01242-1	1	1	n.a.
2	Using traditional agroecological knowledge to adapt to climate change and variability in the Upper East Region of Ghana	Baffour-Ata, F.; Antwi-Agyei, P.; Apawu, G.O.; Nkiaka, E.; Amoah , E.A.; Akorli, R.; Antwi, K.	Environmental Challenges	2021	10.1016/j.envc.2021.100205	1	1	n.a.
6	Perceptions of Risks Related to Climate Change in Agroecosystems in a Semi-arid Region of Brazil	Magalhães, H.F.; Feitosa, I.S.; de Lima Araújo, E.; Albuquerque, U.P.	Human Ecology	2021	10.1007/s10745-021-00247-8	1	1	n.a.
6	Comparative Analysis of Meteorological Records of Climate Variability and Farmers' Perceptions in Sekota Woreda, Ethiopia	Behailu, G.; Ayal, D.Y.; Zeleke, T.T.; Ture, K.; Bantider, A.	Climate Services	2021	10.1016/j.cliser.2021.100239	1	1	n.a.
6	Exploring climate change adaptation practices and household food security in the Middle Eastern context: a case of small family farms in Central Bekaa, Lebanon	Al Dirani, A.; Abebe, G.K.; Bahn, R.A.; Martiniello, G.; Bashour, I.	Food Security	2021	10.1007/s12571-021-01188-2	1	1	n.a.
10	Smallholder Farmers' perception and adaptation to climate variability and change in Fincha sub-basin of the Upper Blue Nile River Basin of Ethiopia	Tessema, I.; Simane, B.	GeoJournal	2021	10.1007/s10708-020-10159-7	1	1	n.a.
6	Perceived Vulnerability and Climate Change Impacts on Small-Scale Fisheries in Davao Gulf, Philippines	Macusi, E.D.; Camaso, K.L.; Barboza, A.; Macusi, E.S.	Frontiers in Marine Science	2021	10.3389/fmars.2021.597385	1	1	n.a.
6	Regional mapping of climate variability index and identifying socio-economic factors influencing farmer's perception in Bangladesh	Rabbi, S.E.; Shant, R.; Karmakar, S.; Habib, A.; Kropp, J.P.	Environment, Development and Sustainability	2021	10.1007/s10668-020-01104-2	1	1	n.a.
27	Pathways of Climate Change Impact on Agroforestry, Food Consumption Pattern, and Dietary Diversity Among Indigenous Subsistence Farmers of Sauria Paharia Tribal Community of India: A Mixed Methods Study	Ghosh-Jerath, S.; Kapoor, R.; Ghosh, U.; Singh, A.; Downs, S.; Fanzo, J.	Frontiers in Sustainable Food Systems	2021	10.3389/fsufs.2021.667297	1	1	n.a.
6	Farm households' perceptions and adaptation strategies to climate change risks and their determinants: Evidence from Raya Azebo district, Ethiopia	Sertse, S.F.; Khan, N.A.; Shah, A.A.; Liu, Y.; Naqvi, S.A.A.	International Journal of Disaster Risk Reduction	2021	10.1016/j.ijdrr.2021.102255	1	1	n.a.
10	Supporting indigenous adaptation in a changing climate: Insights from the stó:Lō research and resource management centre (British Columbia) and the fort apache heritage foundation (Arizona)	Gauer, V.H.; Schaepe, D.M.; Welch ,J.R.	Elementa	2021	10.1525/elementa.2020.00164	1	1	n.a.
10	Water quality threats, perceptions of climate change and behavioral responses among farmers in the ethiopian rift valley	Godebo, T.R.; Jeuland, M.A.; Paul, C.J.; Belachew, D.L.; McCornick P.G.	Climate	2021	10.3390/cli9060092	1	1	n.a.
6	How do agro-pastoralists cope with climate change? The case of the Nyangatom in the Lower Omo Valley of Ethiopia	Gebeyehu, A.K.; Snelder, D.; Sonneveld, B.; Abbink, J.	Journal of Arid Environments	2021	10.1016/j.jaridenv.2021.104485	1	1	n.a.
10	Determinants of farmers' adaptation decisions to climate change in the central coastal region of Vietnam	Vo, H.H.; Mizunoya, T.; Nguyen, C.D.	Asia-Pacific Journal of Regional Science	2021	10.1007/s41685-020-00181-5	1	1	n.a.
2	Comparing farmers' perceptions of climate change with meteorological trends and examining farm adaptation measures in hazard-prone districts of northwest Bangladesh	Roy, D.; Datta, A.; Kuwornu, J.K.M.; Zulfiqar, F.	Environment, Development and Sustainability	2021	10.1007/s10668-020-00989-3	1	1	n.a.
6	Enhancing socioeconomic resilience and climate adaptation through value chain development of mountain products in Hindu Kush Himalayas	Baig, S.M.; Khan, A.A.; Ali, A.; Khan, M.Z.; Ahmed, S.; Shah, G.M.; Ali, G.	Environment, Development and Sustainability	2021	10.1007/s10668-020-00975-9	1	1	n.a.
2	Indigenous adaptation to climate change risks in northern Ghana	Guodaar, L.; Bardsley, D.K.; Suh, J.	Climatic Change	2021	10.1007/s10584-021-03128-7	1	1	n.a.
11	Integrating local perceptions with scientific evidence to understand climate change variability in northern Ghana: A mixed-methods approach	Guodaar, L.; Bardsley, D.K.; Suh, J.	Applied Geography	2021	10.1016/j.apgeog.2021.102440	1	1	n.a.
6	Farm Households' Adoption of Climate-smart Practices in Subsistence Agriculture: Evidence from Northern Togo	Ali, E.	Environmental Management	2021	10.1007/s00267-021-01436-3	1	1	n.a.
6	Farmers' perception on climate extremes and their coping mechanism: Evidences from disaster prone regions of India	Kanwal, V.; Sirohi, S.; Chand, P.	Indian Journal of Traditional Knowledge	2021		1	1	n.a.
6	Farmers' perceptions about changes in climate variables: Perceived risks and household responses in different agro-ecological communities, Southern Ethiopia	Dendir, Z.; Simane, B.	Climate Services	2021	10.1016/j.cliser.2021.100236	1	1	n.a.
2	Assessing Livelihood Vulnerability of Farmers' in Backward Regions of India	Singh, S.	Indian Journal of Agricultural Research	2021	10.18805/IJARe.A-5413	1	1	n.a.
29	Smallholder farmers' perception of climate change and adoption of climate smart agriculture practices in Masaba South Sub-county, Kisii, Kenya	Nyang'au, J.O.; Mohamed, J.H.; Mango, N.; Makate, C.; Wangeci, A.N.	Heliyon	2021	10.1016/j.heliyon.2021.e06789	1	1	n.a.
6	Climate change observations of indigenous communities in the Indian Himalaya	Negi, V.S.; Thakur, S.; Dhyani, R.; Bhatt, I.D.; Rawal, R.S.	Weather, Climate, and Society	2021	10.1175/WCAS-D-20-0077.1	1	1	n.a.

Source	Title	Author	Journal	Year	DOI	Select	Disponible	Reason
6	Climate change risk perceptions and agricultural adaptation strategies in vulnerable riverine char islands of Bangladesh	Ahmed, Z.; Guha, G.S.; Shew, A.M.; Alam, G.M.M.	Land Use Policy	2021	10.1016/j.landusepol.2021.105295	1	1	n.a.
10	Perception of indigenous people of climate change and its impact on the Everest National Nature Preserve	Wang, Shijin.	Meteorological Applications	2021	10.1002/met.1987	1	1	n.a.
6	Drought responses and adaptation strategies to climate change by pastoralists in the semi-arid area, Laikipia County, Kenya	Ndiritu, S.W.	Mitigation and Adaptation Strategies for Global Change	2021	10.1007/s11027-021-09949-2	1	1	n.a.
6	Climate variability, land cover changes and livelihoods of communities on the fringes of bobiri forest reserve, Ghana	Baffour-Ata, F.; Antwi-Agyei, P.; Nkiaka, E.	Forests	2021	10.3390/f12030278	1	1	n.a.
6	Causes, indicators and impacts of climate change: understanding the public discourse in Goat based agro-pastoral livelihood zone, Ethiopia	Mihiretu, A.; Okoyo, E.N.; Lemma, T.	Heliyon	2021	10.1016/j.heliyon.2021.e06529	1	1	n.a.
6	Measurements meet human observations: integrating distinctive ways of knowing in the Pamir Mountains of Tajikistan to assess local climate change	Haag, I.; Kassam, K.-A.; Senftl, T.; Zandler, H.; Samimi, C.	Climatic Change	2021	10.1007/s10584-021-02988-3	1	1	n.a.
6	Climate change and variability perceptions and adaptations of pastoralists' communities in the Maasai Steppe, Tanzania	Nnko, H.J.; Gwakisa, P.S.; Ngonyoka, A.; Estes, A.	Journal of Arid Environments	2021	10.1016/j.jaridenv.2020.104337	1	1	n.a.
6	Perceptions of Climate Variability and Soil Fertility Management Choices Among Smallholder Farmers in Northern Ghana	Martey, E.; Kuwornu, J.K.M.	Ecological Economics	2021	10.1016/j.ecolecon.2020.106870	1	1	n.a.
6	Smallholder farmers' perceptions and knowledge on climate variability and perceived effects in vulnerable rural communities in the Offinso Municipality, Ghana	Appiah, D.O.; Guodaar, L.	Environmental Development	2021	10.1016/j.envdev.2021.100691	1	1	n.a.
16	Elderly smallholder farmers' perceptions of and adaptation to climate variability and change in rural Ghana	Appiah, D.O.; Asante, F.; Antwi-Boadi, L.; Serbeh, R.	Working with Older People	2021	10.1108/WWOP-09-2021-0052	1	0	Not disponible (pay acess).
10	Climate change stressors affecting household food security among Kimandi-Wanyaga smallholder farmers in Murang'a County, Kenya	Ngure, M.W.; Wandiga, S.O.; Olago, D.O.; Oriaso, S.O.	Open Agriculture	2021	10.1515/opag-2021-0042	1	1	n.a.
10	Socio-economic determinants of smallholder mixed crop-livestock farmers' choice of climate change adaptation in the drylands of Northern Ethiopia	Menghistu, H.T.; Tesfay, G.; Abraha, A.Z.; Mawcha, G.T.	International Journal of Climate Change Strategies and Management	2021	10.1108/IJCCSM-09-2020-0099	1	1	n.a.
6	Adaptive livelihood strategies among small-scale fishing households to climate change-related stressors in Central Coast Vietnam	Huynh, P.T.A.; Le, N.D.; Le, S.T.H.; Tran, T.N.	International Journal of Climate Change Strategies and Management	2021	10.1108/IJCCSM-04-2020-0034	1	1	n.a.
6	Sustainable agriculture in Northeastern India: how do tribal farmers perceive and respond to climate change?	Bhalerao, A.K.; Rasche, L.; Scheffran, J.; Schneider, U.A.	International Journal of Sustainable Development and World Ecology	2021	10.1080/13504509.2021.1986750	1	0	Not disponible (pay acess).
10	Smallholder farmers' perception of climate change and adaptation strategy choices in Central Ethiopia	Addis, Y.; Abirdew, S.	International Journal of Climate Change Strategies and Management	2021	10.1108/IJCCSM-09-2020-0096	1	1	n.a.
6	Contributions of non-timber forest products to people in mountain ecosystems and impacts of recent climate change	Gurung, L.J.; Miller, K.K.; Venn, S.; Bryan, B.A.	Ecosystems and People	2021	10.1080/26395916.2021.1957021	1	1	n.a.
6	Spatial Variability and Temporal Trends of Climate Change in Southwest Ethiopia: Association with Farmers' Perception and Their Adaptation Strategies	Habte, A.; Mamo, G.; Worku, W.; Ayalew, D.; Gayler, S.	Advances in Meteorology	2021	10.1155/2021/3863530	1	1	n.a.
6	Farmers' Perception on Climate Variability and its Effects in Ambassel District, Northern Ethiopia	Destaw, F.; Fenta, M.M.	Agricultural Research	2021	10.1007/s40003-021-00573-9	1	1	n.a.
6	What caused smallholders to change farming practices in the era of climate change? Empirical evidence from Sub-Himalayan West Bengal, India	Datta, P.; Behera, B.	GeoJournal	2021	10.1007/s10708-021-10450-1	1	1	n.a.
6	Climate change and hunter-gatherers in montane eastern DR Congo	Batumike, R.; Bulonvu, F.; Imani, G.; Akonkwa, D.; Gahigi, A.; Klein, J.A.; Marchant, R.; Cuni-Sanchez, A.	Climate and Development	2021	10.1080/17565529.2021.1930987	1	1	n.a.
10	Understanding climate change and drought perceptions, impact and responses in the rural Savannah, West Africa	Adaawen, S.	Atmosphere	2021	10.3390/atmos12050594	1	1	n.a.
6	Adaptation to climate change: ethnic groups in Southwest China	Yang, H.; He, J.; Su, Y.; Xu, J.	Environmental Hazards	2021	10.1080/17477891.2021.1926216	1	0	Not disponible (pay acess).
6	Factors affecting small-scale fishers adaptation toward the impacts of climate change: Reflections from south eastern Bangladeshi fishers	Alam, E.; Hridoy, A.-E.E.; Naim, M.	International Energy Journal	2021		1	1	n.a.
10	Responses of the Tharu to climate change-related hazards in the water sector: Indigenous perceptions, vulnerability and adaptations in the western Tarai of Nepal	Chaudhary B.R.; Acciaioli G.; Erskine W.; Chaudhary P.;	Climate and Development	2021	10.1080/17565529.2021.1889947	1	1	n.a.
6	The importance of climate change awareness for the adaptive capacity of ethnic minority farmers in the mountainous areas of Thua Thien Hue province	Sen, L.T.H.; Bond, J.; Phuong, L.T.H.; Winkel, A.; Tran, U.C.; Le, N.V.	Local Environment	2021	10.1080/13549839.2021.1886064	1	1	n.a.
6	Rainfall variability and socio-economic constraints on livestock production in the Ngorongoro Conservation Area, Tanzania	Leweri, C.M.; Msuha, M.J.; Treydte, A.C.	SN Applied Sciences	2021	10.1007/s42452-020-04111-0	1	1	n.a.
6	Livestock farmers' perception and adaptation to climate change: panel evidence from pastoral areas in China	Yang, S.; Yu, L.; Leng, G.; Qiu, H.	Climatic Change	2021	10.1007/s10584-021-02992-7	1	1	n.a.
6	Climate change and high-altitude food security: a small-scale study from the Karnali region in Nepal	Thapa, S.; Hussain, A.	Climate and Development	2021	10.1080/17565529.2020.1855099	1	0	Not disponible (pay acess).
2	Impact of cultural beliefs on smallholders' response to climate change: the case of Bamenda Highlands, Cameroon	Azong, M.N.	International Journal of Environmental Studies	2021	10.1080/00207233.2020.1824866	1	0	Not disponible (pay acess).

Source	Title	Author	Journal	Year	DOI	Select	Disponible	Reason
6	Climate change perceptions, data, and adaptation in the Garhwal Himalayas of India	Platt, R.V.; Ogra, M.; Kisak, N.; Manral, U.; Badola, R.	Climate and Development	2021	10.1080/17565529.2020.1724069	1	1	n.a.
1	Climate change adaptation for managing non-timber forest products in the Nepalese Himalaya	Gurung, L.J.; Miller, K.K.; Venn, S.; Bryan, B.A.	Science of the Total Environment	2021	10.1016/j.scitotenv.2021.148853	1	1	n.a.
1	Social-Ecological Change on the Mongolian Steppe: Herder Perceptions of Causes, Impacts, and Adaptive Strategies	Reid-Shaw, I; Jargalsaihan, A; Reid, RS; Jamsranjav, C; Fernandez-Gimenez, ME	Human Ecology	2021	10.1007/s10745-021-00256-7	1	1	n.a.
7	Interactions between Climate Change and Infrastructure Projects in Changing Water Resources: An Ethnobiological Perspective from the Daasanach, Kenya	Junqueira, A.B.; Fernandez-Llamazares, A.; Torrents-Tico, M.; Haira, P.L.; Nasak, J.G.; Burgas, D.; Fraixedas, S.; Cabeza, M.; Reyes-Garcia, V.	Journal of Ethnobiology	2021	10.2993/0278-0771-41.3.331	1	1	n.a.
1	Knowing the Clouds through the Land: Perceptions of Changes in Climate through Agricultural Practices in Two Nahua Indigenous Communities	Martinez-Herrera, G.; Trejo, I.; Moreno-Calles, A.I.; de Alba-Navarro, M.F.; Martinez-Balleste, A.	Journal of Ethnobiology	2021	10.2993/0278-0771-41.3.849	1	1	n.a.
1	Crop Diversity Management: Sereer Smallholders' Response to Climatic Variability in Senegal	Ruggieri, F.; Porcuna-Ferrer, A.; Gaudin, A.; Faye, N.F.; Reyes-Garcia, V.; Labeyrie, V.	Journal of Ethnobiology	2021	10.2993/0278-0771-41.3.389	1	1	n.a.
1	Climate Change and Its Impacts on Farmer's Livelihood in Different Physiographic Regions of the Trans-Boundary Koshi River Basin, Central Himalayas	Paudel, B.; Wang, Z.F.; Zhang, Y.L.; Rai, M.K.; Paul, P.K.	International Journal of Environmental Research and Public Health	2021	10.3390/ijerph18137142	1	1	n.a.
1	Perception of agricultural drought resilience in South Africa: A case of smallholder livestock farmers	Bahta, Y.T.	Jamba-Journal of Disaster Risk Studies	2021	10.4102/jamba.v13i1.984	1	1	n.a.
1	Defining interpretative communities towards climate change: Examining growers of common bean in Latin America	Barnes, A.P.; Botero, H.; Perez, L.; Rios-Segura, D.; Ramirez-Villegas, J.	International Journal of Agricultural Sustainability	2021	10.1080/14735903.2021.1936419	1	0	Not disponible (pay acess).
1	Perceptions and vulnerability of farming households to climate change in three agro-ecological zones of Ghana	Owusu, V.; Ma, W.L.; Emuah, D.; Renwick, A.	Journal of Cleaner Production	2021	10.1016/j.jclepro.2021.126154	1	1	n.a.
1	Climate change impacts on glacier-fed and non-glacier-fed ecosystems of the Indian Himalayan Region: people's perception and adaptive strategies	Kuniyal, J.C.; Kanwar, N.; Bhoj, A.S.; Rautela, K.S.; Joshi, P.; Kumar, K.; Sofi, M.S.; Bhat, S.U.; Rashid, I.; Lodhi, M.S.; Devi, C.A.; Singh, H.B.	Current Science	2021	10.18520/cs/v120/i5/888-899	1	1	n.a.
1	Differences in local perceptions about climate and environmental changes among residents in a small community in Eastern Siberia	Takakura, H.; Fujioka, Y.; Ignatyeva, V.; Tanaka, T.; Vinokurova, N.; Grigorev, S.; Boyakova, S.	Polar Science	2021	10.1016/j.polar.2020.100556	1	1	n.a.
1	Local Perceptions and Trends of Climate Change in the Sikkim Himalaya, North-East India	Arora, P.; Ali, S.N.; Morthekai, P.	Journal Of Climate Change	2021	10.3233/JCC210008	1	0	Not disponible (pay acess).
26	Perceptions of climate change and adaptation: A subarctic archipelago perspective (Saint-Pierre-and-Miquelon, North America)	Philippenko, X.;Goeldner-Gianella, L.;Le Cozannet, G.;Grancher, D.;De La Torre, Y.	Ocean & Coastal Management	2021	10.1016/j.ocecoaman.2021.105924	1	2	Location: Saint-Pierre-and-Miquelon (city).
3	Determinants of climate change adaptation and perceptions among small-scale farmers of Embu County, Eastern Kenya	Kangai, R.; Chitechi, E. W.; Koske, J.; Waswa, B.; Ngare, I.	African Journal of Environmental Science and Technology	2021	10.5897/AJEST2020.2943	1	1	n.a.
3	Smallholder Farmers' Perception and Adaptation to Climate Change in Kurmuk District, Ethiopia.	Ayansa, A. D.; Bedemo, A.; Jara, G. O.	Applied Economics and Finance	2021	10.11114/aef.v8i5.5362	1	1	n.a.
3	Perception of impacts of climate variability on pastoralists and their adaptation/coping strategies in fentale district of Oromia region, Ethiopia	Mekuyie, M.; Mulu, D.	Environmental Systems Research	2021	10.1186/s40068-020-00212-2	1	1	n.a.
3	Perceptions and adaptation strategies to changing climate: evidence from farmers of northern dry zone of Karnataka.	Dupdal, R.; Patil, B. L.; Naik, B. S.	Indian Journal of Extension Education	2021	10.48165/IJEE.2021.57315	1	1	n.a.
3	Climate Change Adaptation in Akropong, Ghana: Experiences of Female Smallholder Farmers.	Addaney, M.; Sarpong, G. E.; Akudugu, J. A.	Journal of Land and Rural Studies	2021	10.1177/23210249211008537	1	1	n.a.
6	Climate Risks, Farmers Perception and Adaptation Strategies to Climate Variability in Afghanistan	Sarwary, M.; Samiappan, S.; Saravanakumar, V.; Arivelarasan, T.; Manivasagam, V.S.	Emirates Journal of Food and Agriculture	2021	10.9755/ejfa.2021.v33.i12.2797	1	1	n.a.
10	Are smallholder farmers' perceptions of climate variability supported by climatological evidence? Case study of a semi-arid region in South Africa	Rapholo, M.T.; Diko, Makia L.	International Journal of Climate Change Strategies and Management	2020	10.1108/IJCCSM-01-2020-0007	1	1	n.a.
2	Climate change and variability discourse among community members and smallholder farmers in Mutoko District, Zimbabwe	Mugambiwa, S.S.; Rukema, J.R.	Mankind Quarterly	2020	10.46469/MQ.2020.61.2.5	1	1	n.a.
26	Indigenous knowledge in relation to climate change: adaptation practices used by the Xo Dang people of central Vietnam	Van Huynh, C.; Phuong Le, Q.N.; Hong Nguyen, M.T.; Tran, P.T.; Nguyen, T.Q.; Pham, T.G.; Khanh Nguyen, L.H.; Dieu Nguyen, L.T.; Trinh, H.N.	Heliyon	2020	10.1016/j.heliyon.2020.e05656	1	1	n.a.
6	Local perceptions of change in climate and agroecosystems in the Indian Himalayas: A case study of the Kedarnath Wildlife Sanctuary (KWS) landscape, India	Ogra, M.; Manral, U.; Platt, R.V.; Badola, R.; Butcher, L.	Applied Geography	2020	10.1016/j.apgeog.2020.102339	1	1	n.a.
10	Coping with climatic shocks: local perspectives from Haiti's rural mountain regions	Staub, C.; Gilot, A.; Pierre, M.; Murray, G.; Koenig, R.	Population and Environment	2020	10.1007/s11111-020-00351-9	1	1	n.a.
6	Mixed manifestations of climate change in high mountains: insights from a farming community in northern Pakistan	Spies, M.	Climate and Development	2020	10.1080/17565529.2019.1701974	1	0	Not disponible (pay acess).
6	An update on Inuit perceptions of their changing environment, Qikiqtaaluk (Baffin Island, Nunavut)	Sansoulet, J.; Therrien, M.; Delgove, J.; Pouxviel, G.; Desriac, J.; Sardet, N.; Vanderlinden, J.-P.	Elementa	2020	10.1525/elementa.025	1	1	n.a.
6	Fishers' perceptions and attitudes toward weather and climate information services for climate change adaptation in senegal	Diouf, N.S.; Ouedraogo, I.; Zougmoré, R.B.; Niang, M.	Sustainability (Switzerland)	2020	10.3390/su12229465	1	1	n.a.

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6	Trends of climate change and variability in three agro-ecological settings in central Ethiopia: Contrasts of meteorological data and farmers' perceptions	Etana, D.; Snelder, D.J.R.M.; van Wesenbeeck, C.F.A.; Buning, T.C.	Climate	2020	10.3390/cli8110121	1	1	n.a.
6	Using local ecological knowledge of Fishers to infer the impact of climate variability in Galápagos' small-scale fisheries	Cavole, L.M.; Andrade-Vera, S.; Marin Jarrin, J.R.; Dias, D.F.; Aburto-Oropeza, O.; Barrágan-Paladines, M.J.	Marine Policy	2020	10.1016/j.marpol.2020.104195	1	1	n.a.
26	Climate change perceptions and challenges to adaptation among smallholder farmers in semi-arid Ghana: A gender analysis	Assan, E.; Suvedi, M.; Schmitt Olabisi, L.; Bansah, K.J.	Journal of Arid Environments	2020	10.1016/j.jaridenv.2020.104247	1	1	n.a.
10	Perceived Climate Variability and Compounding Stressors: Implications for Risks to Livelihoods of Smallholder Indian Farmers	Singh, R.K.; Singh, A.; Kumar, S.; Sheoran, P.; Sharma, D.K.; Stringer, L.C.; Quinn, C.H.; Kumar, A.; Singh, D.	Environmental Management	2020	10.1007/s00267-020-01345-x	1	1	n.a.
6	Perceptions of climate variability and change in relation to observed data among two east coast communities in Zanzibar, East Africa	Makame, M.O.; Shackleton, S.	Climate and Development	2020	10.1080/17565529.2019.1697633	1	0	Not disponible (pay acess).
6	"We Will Always Ask Ourselves the Question of How to Feed the Family": Subsistence Farmers' Perceptions on Adaptation to Climate Change in Burkina Faso	Sorgho, R.; Mank, I.; Kagoné, M.; Souares, A.; Danquah, I.; Sauerborn, R.	International Journal of Environmental Research and Public Health	2020	10.3390/ijerph17197200	1	1	n.a.
6	Traditional livelihoods under a changing climate: herder perceptions of climate change and its consequences in South Gobi, Mongolia	Mijiddorj, T.N.; Alexander, J.S.; Samelius, G.; Mishra, C.; Boldgiv, B.	Climatic Change	2020	10.1007/s10584-020-02851-x	1	1	n.a.
6	Vietnamese smallholders' perspectives on causes, indicators and determinants of climate change: implication for adaptation strategies	Hoang, H.G.	Climatic Change	2020	10.1007/s10584-020-02827-x	1	1	n.a.
6	Assessment of climate change pattern in the Pauri Garhwal of the Western Himalayan Region: based on climate parameters and perceptions of forest-dependent communities	Jha, S.K.; Negi, A.K.; Alatalo, J.M.; Negi, R.S.; Patasaraiya, M.K.	Environmental Monitoring and Assessment	2020	10.1007/s10661-020-08575-w	1	1	n.a.
6	Assessing farmers' preparedness to cope with the impacts of multiple climate change-related hazards in the Terai lowlands of Nepal	Budhathoki, N.K.; Paton, D.; A. Lassa, J.; Zander, K.K.	International Journal of Disaster Risk Reduction	2020	10.1016/j.ijdrr.2020.101656	1	1	n.a.
6	Perceived livelihood impacts and adaptation of vegetable farmers to climate variability and change in selected sites from Ghana, Uganda and Nigeria	Fadairo, O.; Williams, P.A.; Nalwanga, F.S.	Environment, Development and Sustainability	2020	10.1007/s10668-019-00514-1	1	1	n.a.
6	Changing socio-ecologies of Kalahari: Local perceptions towards environmental change and tourism in Kgalagadi, Botswana	Saarinen, J.; Moswete, N.; Atlhopheng, J.R.; Hambira, W.L.	Development Southern Africa	2020	10.1080/0376835X.2020.1809997	1	1	n.a.
6	No safety net in the face of climate change: The case of pastoralists in Kunene Region, Namibia	Inman, E.N.; Hobbs, R.J.; Tsvuura, Z.	PLoS ONE	2020	10.1371/journal.pone.0238982	1	1	n.a.
10	Factors determining the adoption of strategies used by smallholder farmers to cope with climate variability in the eastern free state, South Africa	Myeni, L.; Moeletsi, M.E.	Agriculture (Switzerland)	2020	10.3390/agriculture10090410	1	2	Location: Harrismith and Phuthaditjhaba towns.
6	Heat, cold, and floods: exploring farmers' motivations to adapt to extreme weather events in the Terai region of Nepal	Budhathoki, N.K.; Paton, D.; Lassa, J.A.; Bhatta, G.D.; Zander, K.K.	Natural Hazards	2020	10.1007/s11069-020-04127-0	1	1	n.a.
6	Vulnerability of the Açaí Palm to Climate Change	Tregidgo, D.; Campbell, A.J.; Rivero, S.; Freitas, M.A.B.; Almeida, O.	Human Ecology	2020	10.1007/s10745-020-00172-2	1	1	n.a.
6	Documentation and validation of climate change perception of an ethnic community of the western Himalaya	Sharma, A.; Batish, D.R.; Uniyal, S.K.	Environmental Monitoring and Assessment	2020	10.1007/s10661-020-08512-x	1	1	n.a.
11	Scale, colonisation and adapting to climate change: Insights from the Arabana people, South Australia	Nursey-Bray, M.; Palmer, R.; Stuart, A.; Arbon, V.; Rigney, L.-I.	Geoforum	2020	10.1016/j.geoforum.2020.05.021	1	2	Arabana indigenous people lives in cities and towns including Adelaide, Alice Springs, and Darwin.
6	Perceived farm-level climatic impacts on coastal agricultural productivity in Bangladesh	Hasan, M.K.; Kumar, L.	Climatic Change	2020	10.1007/s10584-020-02708-3	1	2	This study explores farmer perceptions of changes in farm productivity and perceptions of causes of decreased farm productivity (if any) over the past 10 years compared with more than 10 years back. Study in Bangladesh.
10	Climate Change Grounded on Empirical Evidence as Compared with the Perceptions of Smallholder Farmers in Vhembe District, South Africa	Kom, Z.; Nethengwe, N.S.; Mpandeli, S.; Chikoore, H.	Journal of Asian and African Studies	2020	10.1177/0021909619891757	1	1	n.a.
6	"Bring fishermen at the center": the value of local knowledge for understanding fisheries resources and climate-related changes in Lake Tanganyika	Bulengela, G.; Onyango, P.; Brehm, J.; Staehr, P.A.; Sweke, E.	Environment, Development and Sustainability	2020	10.1007/s10668-019-00443-z	1	1	n.a.
6	Farmers' perceptions and adaptation strategies to climate risks and their determinants: insights from a farming community of Aguie district in Niger	Ado, A.M.; Savadogo, P.; Pervez, A.K.M.K.; Mudimu, G.T.	GeoJournal	2020	10.1007/s10708-019-10011-7	1	1	n.a.
6	Gendered perceptions of climate variability, food insecurity, and adaptation practices in Nepal	Bastakoti, G.B.; Doneys, P.	Climate and Development	2020	10.1080/17565529.2019.1660604	1	0	Not disponible (pay acess).
2	Community perceptions on climate change and natural resources degradation in a tribal context: An empirical study in koraput, odisha	Prakash, R.J.; Damodar, J.; Nibal, D.	Disaster Advances	2020		1	1	n.a.
6	Local community perceptions on landscape change, ecosystem services, climate change, and livelihoods in Gonarezhou national park, Zimbabwe	Musakwa, W.; Mpofu, E.; Nyathi, N.A.	Sustainability (Switzerland)	2020	10.3390/su12114610	1	2	Study about landscape perception and ecosystem services.
2	Farmers' perceptions of climate change and their adaptation strategies: The case of Ngamiland East, Botswana	Sekelemani, A.; Mogomotsi, P.K.; Stone, L.S.; Mogomotsi, G.E.J.; Lekhane, O.	Transactions of the Royal Society of South Africa	2020	10.1080/0035919X.2020.1748749	1	0	Not disponible (pay acess).
6	Adaptation options for small livestock farmers having large ruminants (cattle and buffalo) against climate change in Central	Shahbaz, P.; Boz, I.; ul Haq, S.	Environmental Science and Pollution Research	2020	10.1007/s11356-020-08112-9	1	2	Location: In Punjab, the study consists of Faisalabad, Multan, and Mandi Bahauddin districts

Source	Title	Author	Journal	Year	DOI	Select	Disponible	Reason
	Punjab Pakistan							(cities of Punjab).
6	Life in riverine islands in Bangladesh: Local adaptation strategies of climate vulnerable riverine island dwellers for livelihood resilience	Sarker, M.N.I.; Wu, M.; Alam, G.M.M.; Shouse, R.C.	Land Use Policy	2020	10.1016/j.landusepol.2020.104574	1	1	n.a.
6	Exploring fishermen's local knowledge and perceptions in the face of climate change: the case of coastal Tamil Nadu, India	Madhanagopal, D.; Pattanaik, S.	Environment, Development and Sustainability	2020	10.1007/s10668-019-00354-z	1	1	n.a.
26	Using farmer-based metrics to analyze the amount, seasonality, variability and spatial patterns of rainfall amidst climate change in southern Ethiopia	Cochrane, L.; Lewis, S.C.; Engdaw, M.M.; Thornton, A.; Welbourne, D.J.	Journal of Arid Environments	2020	10.1016/j.jaridenv.2019.104084	1	1	n.a.
11	Changing climate - Changing livelihood: Smallholder's perceptions and adaption strategies	Funk, C.; Raghavan Sathyan, A.; Winker, P.; Breuer, L.	Journal of Environmental Management	2020	10.1016/j.jenvman.2019.109702	1	1	n.a.
6	Dealing with climate change in semi-arid Ghana: understanding intersectional perceptions and adaptation strategies of women farmers	Lawson, E.T.; Alare, R.S.; Salifu, A.R.Z.; Thompson-Hall, M.	GeoJournal	2020	10.1007/s10708-019-09974-4	1	1	n.a.
6	Local knowledge based perceptions on climate change and its impacts in the Rakaposhi valley of Gilgit-Baltistan, Pakistan	Bhatta, L.D.; Udas, E.; Khan, B.; Ajmal, A.; Amir, R.; Ranabhat, S.	International Journal of Climate Change Strategies and Management	2020	10.1108/IJCCSM-05-2019-0024	1	1	n.a.
10	Community perception, adaptation and resilience to extreme weather in the Yucatan Peninsula, Mexico	Metcalfe, S.E.; Schmook, B.; Boyd, D.S.; De la Barreda-Bautista, B.; Endfield, G.E.; Mardero, S.; Manzón Che, M.; Medina González, R.; Munguia Gil, M.T.; Navarro Olmedo, S.; Perea, A.	Regional Environmental Change	2020	10.1007/s10113-020-01586-w	1	1	n.a.
6	Perceptions and knowledge on climate change in local communities in the Offinso Municipality, Ghana	Sraku-Lartey, M.; Buor, D.; Adjei, P.O.-W.; Foli, E.G.	Information Development	2020	10.1177/0266666918811391	1	1	n.a.
6	Perceptions of climate change and its impacts: a comparison between farmers and institutions in the Amazonas Region of Peru	Altea, L.	Climate and Development	2020	10.1080/17565529.2019.1605285	1	0	Not disponible (pay acess).
10	Perceptions of climate change and drivers of insect pest outbreaks in vegetable crops in limpopo province of South Africa	Phophi, M.M.; Mafongoya, P.; Lottering, S.	Climate	2020	10.3390/cli8020027	1	1	n.a.
6	Farmers' understanding of climate change in Nepal Himalayas: important determinants and implications for developing adaptation strategies	Paudel, B.; Zhang, Y.; Yan, J.; Rai, R.; Li, L.; Wu, X.; Chapagain, P.S.; Khanal, N.R.	Climatic Change	2020	10.1007/s10584-019-02607-2	1	1	n.a.
6	Effects of a changing climate on livelihoods of forest dependent communities: Evidence from Buyangu community proximal to Kakamega tropical rain forest in Kenya	Saalu, F.N.; Oriaso, S.; Gyampoh, B.	International Journal of Climate Change Strategies and Management	2020	10.1108/IJCCSM-01-2018-0002	1	1	n.a.
10	Risk perceptions and adaptation strategies of smallholder farmers to climate change and variability in North Shoa Zone, Ethiopia	Tesfahun, A.A.; Chawla, A.S.	Management of Environmental Quality: An International Journal	2020	10.1108/MEQ-04-2019-0076	1	1	n.a.
2	Perception of the impact of climate change on the quality of life and well-being of the inhabitants of the cerro blanco agricultural community, Limarí province, Chile [Percepción del impacto del cambio climático sobre la calidad de vida y el bienestar de los habitantes de la comunidad agrícola cerro blanco, provincia de Limarí, Chile]	Alfaro, A.A.; Cortés, M.E.	Idesia	2020	10.4067/S0718-34292020000400127	1	1	n.a.
6	Small holder farmers' perception and response mechanisms to climate change: Lesson from Tekeze lowland goat and sorghum livelihood zone, Ethiopia	Mihiretu, A.; Okoyo, E.N.; Lemma, T.	Cogent Food and Agriculture	2020	10.1080/23311932.2020.1763647	1	1	n.a.
16	Local trends in rain and temperatures and their perceptions by women from the surroundings of the Sete Cidades national park in Piauí, northeast of Brazil	Batista, W.F.M.; Sparacino, J.; de Espindola, G.M.; de Lucena, R.F.P.; de Barros, R.F.M.	Revista Brasileira de Geografia Fisica	2020	10.26848/rbgf.v13.3.p1035-1049	1	1	n.a.
6	Farmer's perception and adaptation strategies to changing climate in Kashmir Himalayas, India	Lone, F.A.; Maheen, M.; ul Shafiq, M.; Bhat, M.S.; Rather, J.A.	GeoJournal	2020	10.1007/s10708-020-10330-0	1	1	n.a.
27	Impact of climate change and variability on traditional farming systems: Farmers' perceptions from South-West, semi-arid Zimbabwe	Ndlovu, E.; Prinsloo, B.; le Roux, T.	Jamba: Journal of Disaster Risk Studies	2020	10.4102/JAMBA.V12I1.742	1	1	n.a.
10	Impact of Climate Change and Adaptation Measures on Transhumance Herding System in Gatlang, Rasuwa	Rayamajhi, N.; Manandhar, B.	Air, Soil and Water Research	2020	10.1177/1178622120951173	1	1	n.a.
6	Farmers' perceptions of climate change and agricultural adaptation in Burkina Faso	Alvar-Beltrán, J.; Dao, A.; Marta, A.D.; Heureux, A.; Sanou, J.; Orlandini, S.	Atmosphere	2020	10.3390/ATMOS11080827	1	1	n.a.
2	Farmers' perception of climate change and variability in the North-East District of Botswana	Bosekeng, L.C.; Mogotsi, K.; Bosekeng, G.	Livestock Research for Rural Development	2020		1	1	n.a.
27	Resilience of informal settlements to climate change in the mountainous areas of Konso, Ethiopia and QwaQwa, South Africa	Melore, T.W.; Nel, V.	Jamba: Journal of Disaster Risk Studies	2020	10.4102/JAMBA.V12I1.778	1	2	The case studies are from informal settlements found at the periphery of traditional small towns, specifically at the peripheries of Phuthaditjhaba (QwaQwa, South Africa) and Karat (Konso, Ethiopia).
10	"Are they aware, and why?" Bayesian analysis of predictors of smallholder farmers' awareness of climate change and its risks to agriculture	Ng'ombe, J.N.; Tembo, M.C.; Masasi, B.	Agronomy	2020	10.3390/agronomy10030376	1	1	n.a.
1	Understanding the adoption of climate change adaptation strategies among smallholder farmers: Evidence from land reform beneficiaries in South Africa	Thinda, K.T.; Ogundeji, A.A.; Belle, J.A.; Ojo, T.O.	Land Use Policy	2020	10.1016/j.landusepol.2020.104858	1	2	A Zero-inflated double hurdle model was employed to estimate the factors influencing farmers' adoption of adaptation strategies and intensity of adoption at the household level in South Africa.

Source	Title	Author	Journal	Year	DOI	Select	Disponible	Reason
1	Comparative assessment of farmers' perceptions on drought impacts: the case of a coastal lowland versus adjoining mountain foreland region of northern Iran	Hesam, M.; Roshan, G.; Grab, S.W.; Shabahrami, A.R.	Theoretical And Applied Climatology	2020	10.1007/s00704-020-03432-9	1	2	Our research focuses on rural farming communities residing in the towns of Chalus (coastal plain adjacent to the Caspian Sea) and Kelardasht (Alborz mountain foreland).
1	Farmers' perceptions and matching climate records jointly explain adaptation responses in four communities around Lake Tana, Ethiopia	Darabant, A.; Habermann, B.; Sisay, K.; Thurnher, C.; Worku, Y.; Damtew, S.; Lindtner, M.; Burrell, L.; Abiyu, A.	Climatic Change	2020	10.1007/s10584-020-02889-x	1	1	n.a.
1	Climate change, risk perception, and protection motivation among high-altitude residents of the Mt. Everest region in Nepal	Poudyal, N.C.; Joshi, O.; Hodges, D.G.; Bhandari, H.; Bhattarai, P.	Ambio	2020	10.1007/s13280-020-01369-x	1	1	n.a.
1	Exploring Vietnamese cereal smallholders' perceptions and adaptations to temperature and precipitation variability: implications for adaptation strategies	Hoang, H.G.	Local Environment	2020	10.1080/13549839.2020.1805599	1	0	Not disponible (pay acess).
1	Perceptions of weather variability and climate change on goat producers' choice of coping and adaptation strategies: evidence from climate-smart and non-climate-smart villages in the Jirapa and Lawra districts	Tetteh, B.K.D.; Ansah, I.G.K.; Donkoh, S.A.; Appiah-Twumasi, M.; Avornyo, F.K.; Shaibu, M.T.; Partey, S.; Zougmore, R.B.; Tengan, K.; Nyuor, A.; Afosah, E.; Akufo, N.M.	Climate And Development	2020	10.1080/17565529.2019.1664975	1	0	Not disponible (pay acess).
1	Smallholders' awareness of adaptation and coping measures to deal with rainfall variability in Western Kenya	Nyberg, Y.; Jonsson, M.; Ambjornsson, E.L.; Wetterlind, J.; Oborn, I.	Agroecology And Sustainable Food Systems	2020	10.1080/21683565.2020.1782305	1	2	The objective is identify smallholders' awareness of adaptation and coping measures to rainfall variability, and examine similarities and differences between women and men farmers' views and between two geographical areas.
1	The Impacts of Drought and the Adaptive Strategies of Small-Scale Farmers in uMsinga, KwaZulu-Natal, South Africa	Lottering, S.J.; Mafongoya, P.; Lottering, R.	Journal Of Asian And African Studies	2020	10.1177/0021909620916898	1	2	Study about drought.
1	Nepalese farmers' climate change perceptions, reality and farming strategies	Budhathoki, N.K.; Zander, K.K.	Climate And Development	2020	10.1080/17565529.2019.1612317	1	0	Not disponible (pay acess).
1	Variability and change of climate extremes from indigenous herder knowledge and at meteorological stations across central Mongolia	Tumenjargal, S.; Fassnacht, S.R.; Venable, N.B.H.; Kingston, A.P.; Fernandez-Gimenez, M.E.; Batbuyan, B.; Laituri, M.J.; Kappas, M.; Adyabadam, G.	Frontiers Of Earth Science	2020	10.1007/s11707-019-0812-6	1	1	n.a.
1	Climate variability and rural livelihood sustainability: evidence from communities along the Black Volta River in Ghana	Yiridomoh, G.Y.; Sullo, C.; Bonye, S.Z.	Geojournal	2020	10.1007/s10708-020-10144-0	1	1	n.a.
3	Place-based perceptions, resilience and adaptation to climate change by smallholder farmers in rural South Africa.	Tesfuhuney, W. A.; Mbeletshie, E. H.	International Journal of Agricultural Research, Innovation and Technology	2020	10.3329/ijarit.v10i2.51585	1	1	n.a.
3	Trends in climate variables (Temperature and rainfall) and local perceptions of climate change in Lamu, Kenya.	Yvonne, M.; Ouma, G.; Olago, D.; Opondo, M.	Geography, Environment, Sustainability	2020	10.24057/2071-9388-2020-24	1	1	n.a.
3	Smallholder Farmers' Perception and Their Adaptation Strategies to Climate Variability and Change in Ale and Bure Districts of Ilubabor Zone, Southwest Ethiopia	Tadesse, S.; Madduri, V.	International Journal of Sciences: Basic and Applied Research (IJSBAR)	2020		1	1	n.a.
3	Indigenous knowledge in climate change adaptation: Case studies of ethnic minorities in the Northern Mountain Region of Vietnam.	Kieu, T. T. H.; Nguyen, T. N.; Nguyen, T. H. T.; Vu, T. H. A.; Nguyen, Q. T.	Journal of Vietnamese Environment	2020		1	1	n.a.
3	Smallholder Farmers' Perception of Climate Change: The Case of Jamma District of South Wollo Zone, Ethiopia	Tadesse, S.	Developing Country Studies	2020	10.7176/DCS10-9-04	1	1	n.a.
3	Smallholder farmers' perception and adaptation strategies to climate change and variability in Ankesha Guagusa District of Awi Zone, North Western Ethiopia.	Kebede, A.	Journal of Economics and Sustainable Development;	2020	10.7176/JESD/11-1-05	1	1	n.a.
6	Perceptions and practices of climate change adaptation and mitigation strategies among farmers in the Konta Special District, Ethiopia	Abera, N.; Tesema, D.	Environmental and Socio-Economic Studies	2019	10.2478/environ-2019-0019	1	1	n.a.
29	Comparing smallholder farmers' climate change perception with climate data: the case of Adansi North District of Ghana	Asare-Nuamah, P.; Botchway, E.	Heliyon	2019	10.1016/j.heliyon.2019.e03065	1	1	n.a.
10	The link between smallholders' perception of climatic changes and adaptation in Tanzania	Brüssow, K.; Gornott, C.; Faße, A.; Grote, U.	Climatic Change	2019	10.1007/s10584-019-02581-9	1	1	n.a.
6	Pastoral yak rearing system is changing with change in climate: an exploration of North Sikkimin Eastern Himalaya	Feroze, S.M.; Ray, L.I.P.; Singh, K.J.; Singh, R.	Climatic Change	2019	10.1007/s10584-019-02551-1	1	1	n.a.
10	Using traditional ecological knowledge to understand and adapt to climate and biodiversity change on the Pacific coast of North America	Wyllie de Echeverria, V.R.; Thornton, T.F.	Ambio	2019	10.1007/s13280-019-01218-6	1	1	n.a.
26	Smallholder farmers' awareness and perceptions of climate change in Adama district, central rift valley of Ethiopia	Hundera, H.; Mpandeli, S.; Bantider, A.	Weather and Climate Extremes	2019	10.1016/j.wace.2019.100230	1	1	n.a.
6	Constraints to adopting soil fertility management practices in Malawi: A choice experiment approach	Krah, K.; Michelson, H.; Perge, E.; Jindal, R.	World Development	2019	10.1016/j.worlddev.2019.104651	1	2	This paper uses choice experiment to study farmer preferences and constraints that may limit farmer adoption of SFM practices.
6	Farmers' awareness and perception of climate change impacts: case study of Aguie district in Niger	Ado, A.M.; Leshan, J.; Savadogo, P.; Bo, L.; Shah, A.A.	Environment, Development and Sustainability	2019	10.1007/s10668-018-0173-4	1	1	n.a.
6	Pathways of socio-ecological resilience to climate change for fisheries through indigenous knowledge	Inaotombi, S.; Mahanta, P.C.	Human and Ecological Risk Assessment	2019	10.1080/10807039.2018.1482197	1	1	n.a.
29	Understanding smallholder farmers' adaptation behaviors through climate change beliefs, risk perception, trust, and psychological distance: Evidence from wheat growers in Iran	Azadi, Y.; Yazdanpanah, M.; Mahmoudi, H.	Journal of Environmental Management	2019	10.1016/j.jenvman.2019.109456	1	2	Location: Kermanshah district
6	Rural livelihoods and climate change adaptation in laggard transitional economies: A case from Bosnia and Herzegovina	Žurovec, O.; Vedeld, P.O.	Sustainability (Switzerland)	2019	10.3390/su11216079	1	1	n.a.

Source	Title	Author	Journal	Year	DOI	Select	Disponible	Reason
6	The salience of climate change in farmer decision-making within smallholder semi-arid agroecosystems	Waldman, K.B.; Attari, S.Z.; Gower, D.B.; Giroux, S.A.; Caylor, K.K.; Evans, T.P.	Climatic Change	2019	10.1007/s10584-019-02498-3	1	1	n.a.
10	Rethinking indigenous climate governance through climate change and variability discourse by a Zimbabwean rural community	Mugambiwa, S.S.; Rukema, J.R.	International Journal of Climate Change Strategies and Management	2019	10.1108/IJCCSM-11-2018-0074	1	1	n.a.
2	Small-scale fishers' perceptions of climate change and its consequences on fisheries: the case of Sanyathi fishing basin, Lake Kariba, Zimbabwe	Muringai, R.T.; Naidoo, D.; Mafongoya, P.; Sibanda, M.	Transactions of the Royal Society of South Africa	2019	10.1080/0035919X.2019.1639564	1	1	n.a.
26	Indigenous perceptions of climate anomalies in Malaysian Borneo	van Gevelt, T.; Abok, H.; Bennett, M.M.; Fam, S.D.; George, F.; Kulathuramaiyer, N.; Low, C.T.; Zaman, T.	Global Environmental Change	2019	10.1016/j.gloenvcha.2019.101974	1	1	n.a.
10	Exploring the link between climate change perceptions and adaptation strategies among smallholder farmers in Chimanimani district of Zimbabwe	Mutandwa, E.; Hanyani-Mlambo, B.; Manzvera, J.	International Journal of Social Economics	2019	10.1108/IJSE-12-2018-0654	1	1	n.a.
2	Determinants of farmers' awareness of climate change	Mustafa, G.; Latif, I.A.; Bashir, M.K.; Shamsudin, M.N.; Daud, W.M.N.W.	Applied Environmental Education and Communication	2019	10.1080/1533015X.2018.1454358	1	2	Location: Punjab
6	Climate change and pastoralists: perceptions and adaptation in montane Kenya	Cuni-Sanchez, A.; Omeny, P.; Pfeifer, M.; Olaka, L.; Mamo, M.B.; Marchant, R.; Burgess, N.D.	Climate and Development	2019	10.1080/17565529.2018.1454880	1	1	n.a.
6	Climate shocks and responses in Karnali-Mahakali Basins, Western Nepal	Pandey, V.P.; Sharma, A.; Dhaubanjar, S.; Bharati, L.; Joshi, I.R.	Climate	2019	10.3390/CLI7070092	1	1	n.a.
6	Perceived climate variability and farm level adaptation in the Central River Region of The Gambia	Bagagnan, A.R.; Ouedraogo, I.; Fonta, W.M.	Atmosphere	2019	10.3390/atmos10070423	1	1	n.a.
6	Encounters between experiences and measurements: The role of local knowledge in climate change research	Kieslinger, J.; Pohle, P.; Buitrón, V.; Peters, T.	Mountain Research and Development	2019	10.1659/MRD-JOURNAL-D-18-00063.1	1	1	n.a.
10	Mountain farming systems' exposure and sensitivity to climate change and variability: Agroforestry and conventional agriculture systems compared in Ecuador's Indigenous Territory of Kayambi people	Córdova, R.; Hogarth, N.J.; Kanninen, M.	Sustainability (Switzerland)	2019	10.3390/su11092623	1	1	n.a.
6	Climate change and variability perceptions in Ga-Dikgale community in Limpopo Province, South Africa	Chikosi, E.S.; Mugambiwa, S.S.; Tirivangasi, H.M.; Rankoana, S.A.	International Journal of Climate Change Strategies and Management	2019	10.1108/IJCCSM-01-2018-0004	1	2	Ga-Dikgale is a community of about 9,000 people and consists of 23 villages. The site is peri-urban.
6	Pastoralists' perception of and adaptation strategies for climate change: associations with observed climate variability	Zhang, Q.; Cui, F.; Dai, L.; Feng, B.; Lu, Y.; Tang , H.	Natural Hazards	2019	10.1007/s11069-019-03620-5	1	1	n.a.
6	Indigenous people's perceptions about climate change, forest resource management, and coping strategies: a comparative study in Bangladesh	Ahmed, M.N.Q.; Atiqul Haq, S.M.	Environment, Development and Sustainability	2019	10.1007/s10668-017-0055-1	1	1	n.a.
10	Cognitive biases about climate variability in smallholder farming systems in Zambia	Waldman, K.B.; Vergopolan, N.; Attari, S.Z.; Sheffield, J.; Estes, L.D.; Caylor, K.K.; Evans, T.P.	Weather, Climate, and Society	2019	10.1175/WCAS-D-18-0050.1	1	1	n.a.
2	Climate change and finger millet: Perception, trend and impact on yield in different ecological regions in Central Nepal	Luitel, D.R.; Siwakoti, M.; Jha, P.K.	Journal of Mountain Science	2019	10.1007/s11629-018-5165-1	1	1	n.a.
6	Cryospheric hazards and risk perceptions in the Sagarmatha (Mt. Everest) National Park and Buffer Zone, Nepal	Sherpa, S.F.; Shrestha, M.; Eakin, H.; Boone, C.G.	Natural Hazards	2019	10.1007/s11069-018-3560-0	1	1	n.a.
6	Recent intensification of the seasonal rainfall cycle in equatorial Africa revealed by farmer perceptions, satellite-based estimates, and ground-based station measurements	Salerno, J.; Diem, J.E.; Konecky, B.L.; Hartter, J.	Climatic Change	2019	10.1007/s10584-019-02370-4	1	1	n.a.
6	Fishers' decisions to adopt adaptation strategies and expectations for their children to pursue the same profession in Chumphon Province, Thailand	Sereenonchai, S.; Arunrat, N.	Climate	2019	10.3390/cli7020034	1	1	n.a.
6	Variability in perceptions of household livelihood resilience and drought at the intersection of gender and ethnicity	Quandt, A.	Climatic Change	2019	10.1007/s10584-018-2343-7	1	1	n.a.
6	Climate change perception: an analysis of climate change and risk perceptions among farmer types of Indian Western Himalayas	Shukla, R.; Agarwal, A.; Sachdeva, K.; Kurths, J.; Joshi, P.K.	Climatic Change	2019	10.1007/s10584-018-2314-z	1	1	n.a.
10	Climate change perceptions and attitudes to smallholder adaptation in northwestern Nigerian drylands	Jellason, N.P.; Baines, R.N.; Conway, J.S.; Ogbaga, C.C.	Social Sciences	2019	10.3390/socsci8020031	1	1	n.a.
16	Adaptive strategies of smallholder farming systems to changing climate conditions in the vicinity of kogyae strict nature reserve within the forest-savanna transitional zone of Ghana	Pabi, O.; Ayivor, J.S.; Ofori, B.D.	West African Journal of Applied Ecology	2019		1	1	n.a.
2	Public perception on climate change and its impacts on various aspects: A case study of Great Himalayan national Park (India)	Devi, V.; Fulekar, M.H.; Pathak, B.	Indian Journal of Ecology	2019		1	0	Not disponible (pay acess).
6	Indigenous knowledge and farmer perceptions of climate and ecological changes in the bamenda highlands of cameroon: Insights from the bui plateau	Tume, S.J.P.; Kimengsi, J.N.; Fogwe, Z.N.	Climate	2019	10.3390/cli7120138	1	1	n.a.
6	Perceptions of climate variability and determinants of farmers' adaptation strategies in the highlands of Southwest Cameroon	Ngoe, M.; Zhou, L.; Mukete, B.; Enjema, M.	Applied Ecology and Environmental Research	2019	10.15666/aeer/1706_1504115054	1	1	n.a.
6	Community perceptions of climate change and initiatives for the conservation of endemic plants in Limpopo Province, South Africa	Rankoana, S.A.	Weather	2019	10.1002/wea.3272	1	1	n.a.
10	Challenges of performing socio-environmental interdisciplinary research: The experience of the Brazilian Research Network on Climate Change (Rede CLIMA)	Litre, G.; Bursztyn, M.; Rodrigues Filho, S.; Mesquita, P.	Desenvolvimento e Meio Ambiente	2019	10.5380/dma.v51i0.60365	1	2	This paper explores the research team internal dynamics and the main challenges faced during the creation of a shared research protocol to collect and interpret data from an interdisciplinary point of view.

Source	Title	Author	Journal	Year	DOI	Select	Disponible	Reason
10	Farmers' Perceptions of Climate Change Trends and Adaptation Strategies in Semiarid Highlands of Eastern Tigray, Northern Ethiopia	Kahsay, H.T.; Guta, D.D.; Birhanu, B.S.; Gidey, T.G.; Routray, J.K.	Advances in Meteorology	2019	10.1155/2019/3849210	1	1	n.a.
10	Smallholder farmers' perceptions and adaptive response to climate variability and climate change in southern rural Ghana	Yamba, S.; Appiah, D.O.; Siaw , L.P.	Cogent Social Sciences	2019	10.1080/23311886.2019.1646626	1	1	n.a.
6	Climate change perceptions and adaptive actions by pastoral community on the Tibetan plateau, China	Sharif, J.; Rafiq, M.K.; Rafiq, M.T.; Aziz, R.; Qayyum, A.; Saleem, A.R.; Nisa, W.U.; Jenks, M.A.; Li, Y.	Applied Ecology and Environmental Research	2019	10.15666/aeer/1704_79878009	1	1	n.a.
6	Climate change perception and adaptation in Nigeria's guinea savanna: Empirical evidence from farmers in nasarawa state, Nigeria	Tarfa, P.Y.; Ayuba, H.K.; Onyeneke, R.U.; Idris, N.; Nwajiuba, C.A.; Igberi, C.O.	Applied Ecology and Environmental Research	2019	10.15666/aeer/1703_70857112	1	1	n.a.
10	Role of traditional ecological knowledge and seasonal calendars in the context of climate change: A case study from China	Yang, H.; Ranjitkar, S.; Zhai, D.; Zhong, M.; Goldberg, S.D.; Salim, M.A.; Wang, Z.; Jiang, Y.; Xu, J.	Sustainability (Switzerland)	2019	10.3390/SU11123243	1	1	n.a.
2	Climate change effects on crop production in Yatta sub-County: Farmer perceptions and adaptation strategies	Agesa, B.L.; Onyango, C.M.; Kathumo, V.M.; Onwonga, R.N.; Karuku, G.N.	African Journal of Food, Agriculture, Nutrition and Development	2019	10.18697/AJFAND.84.BLFB1017	1	1	n.a.
6	Local ecological knowledge on climate change and ecosystem-based adaptation strategies promote resilience in the Middle Zambezi Biosphere Reserve, Zimbabwe	Kupika, O.L.; Gandiwa, E.; Nhamo, G.; Kativu, S.	Scientifica	2019	10.1155/2019/3069254	1	1	n.a.
2	Climate change impact on quality of life indicators of pastoralists (case study: Rangelands of Haraz River Basin, Mazandaran province, Iran)	Kavianpoor, A.H.; Barani, H.; Sepehri, A.; Bahremand, A.; Moradi, H.R.	Journal of Rangeland Science	2019		1	1	n.a.
6	Local perceptions and adaptation of indigenous communities to climate change: Evidences from high mountain pangi valley of Indian himalayas	Meena, R.K.; Vikas; Verma, T.P.; Yadav, R.P.; Mahapatra, S.K.; Surya, J.N.; Singh, D.; Singh, S.K.	Indian Journal of Traditional Knowledge	2019		1	1	n.a.
26	Vulnerability to climate change of smallholder farmers in the Hamadan province, Iran	Jamshidi, O.; Asadi, A.; Kalantari, K.; Azadi, H.; Scheffran, J.	Climate Risk Management	2019	10.1016/j.crm.2018.06.002	1	1	n.a.
1	Perceptions of climate and climate change by Amazonian communities	Funatsu, B.M.; Dubreuil, V.; Racape, A.; Debortoli, N.S.; Nasuti, S.; Le Tourneau, F.M.	Global Environmental Change-Human And Policy Dimensions	2019	10.1016/j.gloenvcha.2019.05.007	1	1	n.a.
1	Does Awareness of Climate Change Lead to Worry. Exploring Community Perceptions Through Parallel Analysis in Rural Himalaya	Chakraborty, R.; Daloz, A.S.; Kumar, M.; Dimri, A.P.	Mountain Research And Development	2019	10.1659/MRD-JOURNAL-D-19-00012.1	1	2	Study with community members, district/state bureaucrats, regional scientists, civil society workers, and commercial business owners.
1	Adapting to changing climate through improving adaptive capacity at the local level - The case of smallholder horticultural producers in Ghana	Williams, P.A;. Crespo, O.; Abu, M.	Climate Risk Management	2019	10.1016/j.crm.2018.12.004	1	1	n.a.
1	Climate change in Lamjung District, Nepal: meteorological evidence, community perceptions, and responses	Joshi, A.; Farquhar, S.; Assareh, N.; Dahlet, L.; Landahl, E.	Environmental Research Communications	2019	10.1088/2515-7620/ab1762	1	1	n.a.
1	Risk experience and smallholder farmers' climate change adaptation decision	Habtemariam, L.T.; Gandorfer, M.; Kassa, G.A.; Sieber, S.	Climate And Development	2019	10.1080/17565529.2019.1630351	1	0	Not disponible (pay acess).
1	Harnessing diverse knowledge and belief systems to adapt to climate change in semi-arid rural Africa	Spear, D.; Selato, J.C.; Mosime, B.; Nyamwanza, A.M.	Climate Services	2019	10.1016/j.cliser.2019.05.001	1	2	This study uses the case of Bobirwa subdistrict in Botswana to investigate the role of traditional norms and religious beliefs in the use of place-based and national meteorological forecast information to inform adaptation.
1	Perception of weather and seasonal drought forecasts and its impact on livelihood in East Nusa Tenggara, Indonesia	Kuswanto, H.; Hibatullah, F.; Soedjono, E.S.	Heliyon	2019	10.1016/j.heliyon.2019.e02360	1	2	A cross-sectional study was conducted in 2018 to assess the perception of households on drought forecasts and its impact on crop and livestock losses.
1	Resilience to climate variability: the role of perceptions and traditional knowledge in the Colombian Andes	Vargas, C.A.C.; Romero, S.H.; Leon-Sicard, O.	Agroecology And Sustainable Food Systems	2019	10.1080/21683565.2019.1649782	1	1	n.a.
1	Explaining the uncertainty: understanding small-scale farmers' cultural beliefs and reasoning of drought causes in Gaza Province, Southern Mozambique	Salite, D.	Agriculture And Human Values	2019	10.1007/s10460-019-09928-z	1	1	n.a.
1	Managing the impacts of drought: The role of cultural beliefs in small-scale farmers' responses to drought in Gaza Province, southern Mozambique	Salite, D.; Poskitt, S.	International Journal Of Disaster Risk Reduction	2019	10.1016/j.ijdrr.2019.101298	1	2	This paper first shows how farmers have been adversely affected by drought and why the impacts are memorable and strong enough to trigger the need for responses to tackle its causes and reduce its impacts.
1	Linking livelihood assets of smallholder households to risk management strategies: an empirical study in China	Zhang, Q.; Xue, H.L.; Zhao, X.Y.; Tang, H.P.	Environmental Hazards-Human And Policy Dimensions	2019	10.1080/17477891.2018.1538866	1	2	Therefore, our study, based on the SLA framework, focuses on who in this environment perceives what livelihood risks rather than on 'objective' measurements of occurrences and severities of various undesirable states of nature. We are also interested in the role of livelihood assets in the farmers' preferred risk management strategies.
26	The perception of climate change: Comparative evidence from the small-island societies of Bougainville and Palawan	Pondorfer, A.	Environmental Development	2019	10.1016/j.envdev.2019.04.002	1	1	n.a.
3	Perceived Climate Change Impacts and Adaptation Strategy of Indigenous Community (Chepangs) in Rural Mid-hills of Nepal	Khanal, P.; Wagle, B. H.; Upadhaya, S.; Ghimire, P.; Acharya, S	Forestry: Journal of Institute of Forestry, Nepal	2019	10.3126/forestry.v16i0.28353	1	1	n.a.
3	Effects of Climate Change on Tropical Forest Ecosystem of Three Selected Local Government in Rivers State, Nigeria	Nnadi, P. C.; Amadi, G. O.	Journal of Applied Sciences and Environmental Management	2019	10.4314/jasem.v23i1.13	1	1	n.a.

Source	Title	Author	Journal	Year	DOI	Select	Disponible	Reason
3	Less Rain and More Heat": Smallholders' Perception and Climate Change Adaptation Strategies in Tropical Environments	Ramírez, K. D. I.;Ibarra, A. M. A.	Sociedad y Ambiente	2019	10.31840/sya.v0i21.2040	1	1	n.a.
3	Perception of climate change and adaptation among small-holder cassava farmers in Anambra State, Nigeria	Madu, T.U.	Nigeria Agricultural Journal	2019		1	1	n.a.
3	Assessment of food crop farmers indigenous strategies to climate change mitigation and adaptation in Imo State, Nigeria	Chidiebere-Mark, N. M.; Ejike, R. D.; Nwaiwu, J. C.; Nwankwo, O. O.; Ibe, G. O.	Journal of Agriculture and Food Sciences	2019		1	1	n.a.
3	Climate change perception and adaptation among indigenous farmers : A study on Thamis of Dolkha	Thapa, B. J.	Banko Janakari	2019	10.3126/banko.v29i2.28098	1	1	n.a.
3	Choice of Smallholder Farmers' Adaptation Strategies to Climatic Variability and Their Determinants in Crop Production: The Case of the Central Rift Valley of Ethiopia	Bekele, A.	Journal of Environment and Earth Science	2019	10.7176/JEES/9-4-04	1	1	n.a.
2	Smallholder farmers' perception to climate change impact on crop production: Case from drought prone areas of Bangladesh	Roy, D.; Kowsari, M.S.; Nath, T.D.; Taiyebi, K.A.; Rashid, M.M.	International Journal of Agricultural Technology	2018		1	1	n.a.
6	Risk perception and decision-making: do farmers consider risks from climate change?	Eitzinger, A.; Binder, C.R.; Meyer, M.A.	Climatic Change	2018	10.1007/s10584-018-2320-1	1	1	n.a.
6	Climate change perception and impacts on cattle production in pastoral communities of northern Tanzania	Kimaro, E.G.; Mor, S.M.; Toribio, J.-A.L.M.L.	Pastoralism	2018	10.1186/s13570-018-0125-5	1	1	n.a.
10	Indian time: time, seasonality, and culture in Traditional Ecological Knowledge of climate change	Chisholm Hatfield, S.; Marino, E.; Whyte, K.P.; Dello, K.D.; Mote, P.W.	Ecological Processes	2018	10.1186/s13717-018-0136-6	1	1	n.a.
2	Farmers' perception of climate change and adaptation strategies in the Dabus watershed, North-West Ethiopia	Asrat, P.; Simane, B.	Ecological Processes	2018	10.1186/s13717-018-0118-8	1	1	n.a.
10	Perceptions of climate change impacts and adaptation measures used by crop smallholder farmers in Amathole district municipality, Eastern Cape province, South Africa	Popoola, O.O.; Monde, N.; Yusuf, S.F.G.	GeoJournal	2018	10.1007/s10708-017-9829-0	1	1	n.a.
6	Climate change perceptions and adaptations of smallholder farmers in Eastern Kenya	Kichamu, E.A.; Ziro, J.S.; Palaniappan, G.; Ross, H.	Environment, Development and Sustainability	2018	10.1007/s10668-017-0010-1	1	1	n.a.
26	We're the same as the Inuit!: Exploring Australian Aboriginal perceptions of climate change in a multidisciplinary mixed methods study	Nash, D.; Memmott, P.; Reser, J.; Suliman, S.	Energy Research and Social Science	2018	10.1016/j.erss.2018.06.027	1	1	n.a.
2	Human perception of climate change	Rankoana, S.A.	Weather	2018	10.1002/wea.3204	1	1	n.a.
11	Climate change adaptation: Linking indigenous knowledge with western science for effective adaptation	Makondo, C.C.; Thomas, D.S.G.	Environmental Science and Policy	2018	10.1016/j.envsci.2018.06.014	1	1	n.a.
11	Climate, the Earth, and God – Entangled narratives of cultural and climatic change in the Peruvian Andes	Scoville-Simonds, M.	World Development	2018	10.1016/j.worlddev.2018.06.012	1	1	n.a.
26	Perceptions of climate change variability and adaptation strategies on smallholder dairy farming systems: Insights from Siaya Sub-County of Western Kenya	Wetende, E.; Olago, D.; Ogara, W.	Environmental Development	2018	10.1016/j.envdev.2018.08.001	1	1	n.a.
10	In the light of change: a mixed methods investigation of climate perceptions and the instrumental record in northern Sweden	Furberg, M.; Hondula, D.M.; Saha, M.V.; Nilsson, M.	Population and Environment	2018	10.1007/s11111-018-0302-x	1	1	n.a.
6	Local perceptions of environmental changes in fishing communities of southwest Madagascar	Lemahieu, A.; Scott, L.; Malherbe, W.S.; Mahatante, P.T.; Randrianarimanana, J.V.; Aswani, S.	Ocean and Coastal Management	2018	10.1016/j.ocecoaman.2018.06.012	1	1	n.a.
10	Perception of Climate Change and Impact on Land Allocation and Income: Empirical Evidence from Vietnam's Delta Region	Mishra, A.K.; Pede, V.O.; Barboza, G.A.	Agricultural and Resource Economics Review	2018	10.1017/age.2018.11	1	2	Therefore, the objective of this study is twofold: (1) to investigate the factors associated with perceived climatic change in the fragile M&RRD ecosystem; and (2) to estimate the impact of perceived climatic change on land allocation to paddy and on smallholders' rice income.
6	Evolving high altitude livelihoods and climate change: a study from Rasuwa District, Nepal	Merrey, D.J.; Hussain, A.; Tamang, D.D.; Thapa, B.; Prakash, A.	Food Security	2018	10.1007/s12571-018-0827-y	1	1	n.a.
6	Rainfall variability and drought characteristics in two agro-climatic zones: An assessment of climate change challenges in Africa	Ayanlade, A.; Radeny, M.; Morton, J.F.; Muchaba, T.	Science of the Total Environment	2018	10.1016/j.scitotenv.2018.02.196	1	1	n.a.
6	Understanding climate change perception in community-based management contexts: Perspectives of two indigenous communities	Ambrosio-Albala, P.; Delgado-Serrano, M.M.	Weather, Climate, and Society	2018	10.1175/WCAS-D-17-0049.1	1	1	n.a.
6	Comparing smallholder farmers' perception of climate change with meteorological data: Experience from seven agroecological zones of Tanzania	Mkonda, M.Y.; He, X.; Festin, E.S.	Weather, Climate, and Society	2018	10.1175/WCAS-D-17-0036.1	1	1	n.a.
10	Farmers' perspectives: Impact of climate change on African indigenous vegetable production in Kenya	Chepkoech, W.; Mungai, N.W.; Stöber, S.; Bett, H.K.; Lotze-Campen, H.	International Journal of Climate Change Strategies and Management	2018	10.1108/IJCCSM-07-2017-0160	1	1	n.a.
6	Climate variability, perceptions of pastoralists and their adaptation strategies: Implications for livestock system and diseases in Borana zone	Ayal, D.Y.; Radeny, M.; Desta, S.; Gebru, G.	International Journal of Climate Change Strategies and Management	2018	10.1108/IJCCSM-06-2017-0143	1	1	n.a.
6	Artisan fishers' perception of climate change and disasters in coastal Bangladesh	Hasan, Z.; Nursey-Bray, M.	Journal of Environmental Planning and Management	2018	10.1080/09640568.2017.1339026	1	0	Not disponible (pay acess).
6	Indigenous Adaptation Practices for the Development of Climate Resilient Ecosystems in the Hail Haor, Bangladesh	Monwar, M.M.; Mustafa, M.G.; Khan, N.A.; Hossain, M.S.; Hossain, M.M.; Majumder, M.K.; Chowdhury, R.M.; Islam, M.A.; Chowdhury, M.; Alam, M.S.	Global Social Welfare	2018	10.1007/s40609-014-0014-9	1	1	n.a.

Source	Title	Author	Journal	Year	DOI	Select	Disponible	Reason
2	Farmers' perceptions about climate change vulnerabilities and their adaptation measures in District Swat	Bacha, M.S.; Nafees, M.; Adnan, S.	Sarhad Journal of Agriculture	2018	10.17582/journal.sja/2018/34.2.311.326	1	1	n.a.
6	Climate change adaptation strategies and food productivity in Nepal: a counterfactual analysis	Khanal, U.; Wilson, C.; Lee, B.L.; Hoang, V.-N.	Climatic Change	2018	10.1007/s10584-018-2214-2	1	1	n.a.
6	Evaluation of small-scale fishers' perceptions on climate change and their coping strategies: Insights from lake Malawi	Limuwa, M.M.; Sitaula, B.K.; Njaya, F.; Storebakken, T.	Climate	2018	10.3390/cli6020034	1	1	n.a.
6	Assessing climate change vulnerability and local adaptation strategies in adjacent communities of the Kribi-Campo coastal ecosystems, South Cameroon	Evariste, F.F.; Denis Jean, S.; Victor, K.; Claudia, M.	Urban Climate	2018	10.1016/j.uclim.2017.12.007	1	1	n.a.
12	Phenological cues intrinsic in indigenous knowledge systems for forecasting seasonal climate in the Delta State of Nigeria	Fitchett, J.M.; Ebhuoma, E.	International Journal of Biometeorology	2018	10.1007/s00484-017-1495-x	1	1	n.a.
6	Analysis of observed and perceived climate change and variability in Arsi Negele District, Ethiopia	Mekonnen, Z.; Kassa, H.; Woldeamanuel, T.; Asfaw, Z.	Environment, Development and Sustainability	2018	10.1007/s10668-017-9934-8	1	1	n.a.
6	Farmers and policy-makers' perceptions of climate change in Ethiopia	Hameso, S.	Climate and Development	2018	10.1080/17565529.2017.1291408	1	1	n.a.
26	Smallholder farmer perceived effects of climate change on agricultural productivity and adaptation strategies	Makuvaro, V.; Walker, S.; Masere, T.P.; Dimes, J.	Journal of Arid Environments	2018	10.1016/j.jaridenv.2018.01.016	1	1	n.a.
6	Whose knowledge matters in climate change adaptation? Perceived and measured rainfall trends during the last half century in south-western Tanzania	Pauline, N.M.; Grab, S.	Singapore Journal of Tropical Geography	2018	10.1111/sjtg.12232	1	1	n.a.
10	Agro-pastoralists' determinants of adaptation to climate change	Kgosikoma, K.R.; Lekota, P.C.; Kgosikoma, O.E.	International Journal of Climate Change Strategies and Management	2018	10.1108/IJCCSM-02-2017-0039	1	1	n.a.
6	Perceptions of climate and ocean change impacting the resources and livelihood of small-scale fishers in the South Brazil Bight	Martins, I.M.; Gasalla, M.A.	Climatic Change	2018	10.1007/s10584-018-2144-z	1	1	n.a.
6	Climate variability/change and attitude to adaptation technologies: a pilot study among selected rural farmers' communities in Nigeria	Ayanlade, A.; Radeny, M.; Akin-Onigbinde, A.I.	GeoJournal	2018	10.1007/s10708-017-9771-1	1	1	n.a.
6	Climate change perceptions and response strategies of forest fringe communities in Indian Eastern Himalaya	Dey, T.; Pala, N.A.; Shukla, G.; Pal, P.K.; Das, G.; Chakarvarty, S.	Environment, Development and Sustainability	2018	10.1007/s10668-017-9920-1	1	1	n.a.
6	Risk perception and adaptive responses to climate change and climatic variability in northeastern St. Vincent	Smith, R.-A.	Journal of Environmental Studies and Sciences	2018	10.1007/s13412-017-0456-3	1	1	n.a.
11	Impacts of environmental change on agroecosystems and livelihoods in Annapurna Conservation Area, Nepal	Dangi, M.B.; Chaudhary, R.P.; Rijal, K.; Stahl, P.D.; Belbase, S.; Gerow, K.G.; Fernandez, D.; Pyakurel, B.	Environmental Development	2018	10.1016/j.envdev.2017.10.001	1	2	This study focuses on people's perception of climate change based on their local experience and the everyday lives of individual farmers, hoteliers, entrepreneurs, community leaders, policymakers, conservation officers, and government staff in the study area.
6	Signs of Climate Warming Through the Eyes of Yak Herders in Northern Bhutan	Wangchuk, K.; Wangdi, J.	Mountain Research and Development	2018	10.1659/MRD-JOURNAL-D-17-00094.1	1	1	n.a.
16	Indigenous understanding of climate change, impacts and coping strategies in a rural setting of Kwara State, Nigeria	Tunde, A.M.; Ajadi, B.S.	Geography, Environment, Sustainability	2018	10.24057/2071-9388-2018-11-4-85-99	1	1	n.a.
6	Smallholder farmers' insight on climate change in rural Ghana	Odame Appiah, D.; Akondoh, A.C.K.; Tabiri, R.K.; Donkor, A.A.	Cogent Food and Agriculture	2018	10.1080/23311932.2018.1436211	1	1	n.a.
16	Farmers perception on climate change and determinants of adaptation strategies in Benishangul-Gumuz Regional State of Ethiopia	Mesfin, A.H.; Bekele, A.	International Journal on Food System Dynamics	2018	10.18461/ijfsd.v9i5.956	1	1	n.a.
10	Perception of and response to climate change by maize-dependent smallholders	Bedeke, S.B.; Vanhove, W.; Wordofa, M.G.; Natarajan, K.; Van Damme, P.	Climate Research	2018	10.3354/cr01524	1	1	n.a.
2	A gendered perspective on the fish value chain, livelihood patterns and coping strategies under climate change - insights from Malawi's small-scale fisheries	Limuwa, M.M.; Synnevåg, G.	African Journal of Food, Agriculture, Nutrition and Development	2018	10.18697/ajfand.82.17580	1	1	n.a.
26	Climate trends, risks and coping strategies in smallholder farming systems in Uganda	Mubiru, D.N.; Radeny, M.; Kyazze, F.B.; Zziwa, A.; Lwasa, J.; Kinyangi, J.; Mungai, C.	Climate Risk Management	2018	10.1016/j.crm.2018.08.004	1	1	n.a.
26	Understanding climate change impacts on water buffalo production through farmers' perceptions	Escarcha, J.F.; Lassa, J.A.; Palacpac, E.P.; Zander, K.K.	Climate Risk Management	2018	10.1016/j.crm.2018.03.003	1	1	n.a.
10	Indigenous knowledge of rural communities for combating climate change impacts in west central ethiopia	Amare, Z.Y.	Journal of Agricultural Extension	2018	10.4314/jae.v22i1.16	1	1	n.a.
6	Are smallholder farmers' perceptions of climate variability and change supported by climate records? A case study of Lower Gweru in Semiarid Central Zimbabwe	Makuvaro, V.; Murewi, C.T.F.; Dimes, J.; Chagonda, I.	Weather, Climate, and Society	2018	10.1175/WCAS-D-16-0029.1	1	2	The objective of this study was to verify smallholder farmers' perceptions on climate variability and change, using historical daily climate data. Farmer perceptions used in this study were obtained from a baseline survey on ''Building Adaptive Capacity to Cope with Increasing Vulnerability due to Climate Change'' conducted in the two wards during the 2008/09 season, under the International Development Research Centre Climate Change and Adaptation in Africa (IDRC CCAA) project (Mugabe et al. 2010).
6	People's perception of climate change impacts and their adaptation practices in Khotokha valley, Wangdue, Bhutan	Suberi, B.; Tiwari, K.R.; Gurung, D.B.; Bajracharya, R.M.; Sitaula, B.K.	Indian Journal of Traditional Knowledge	2018		1	1	n.a.

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26	Climate change adaptation in the western-Himalayas: Household level perspectives on impacts and barriers	Pandey, R.; Kumar, P.; Archie, K.M.; Gupta, A.K.; Joshi, P.K.; Valente, D.; Petrosillo, I.	Ecological Indicators	2018	10.1016/j.ecolind.2017.08.021	1	1	n.a.
1	Drivers of response to extreme weather warnings among marine fishermen	Malakar, K.; Mishra, T.; Patwardhan, A.	Climatic Change	2018	10.1007/s10584-018-2284-1	1	2	This study is an attempt to assess the factors driving fishermen's decision to respond to weather warnings.
1	Merging Indigenous Knowledge Systems and Station Observations to Estimate the Uncertainty of Precipitation Change in Central Mongolia	Fassnacht, S.R.; Allegretti, A.M.; Venable, N.B.H.; Fernandez-Gimenez, M.E.; Tumenjargal, S.; Kappas, M.; Laituri, M.J.; Batbuyan, B.; Pfohl, A.K.D.	Hydrology	2018	10.3390/hydrology5030046	1	1	n.a.
1	Wading past assumptions: Gender dimensions of climate change adaptation in coastal communities of the Philippines	Graziano, K.; Pollnac, R.; Christie, P.	Ocean & Coastal Management	2018	10.1016/j.ocecoaman.2018.01.029	1	1	n.a.
1	Individual Local Farmers' Perceptions of Environmental Change in Tanzania	Roschel, L.; Graef, F.; Dietrich, O.; Schafer, M.P.; Haase, D.	Water	2018	10.3390/w10040525	1	1	n.a.
1	Variation in perception of environmental change in nine Solomon Islands communities: implications for securing fairness in community-based adaptation	Ensor, J.E.; Abernethy, K.E.; Hoddy, E.T.; Aswani, S.; Albert, S.; Vaccaro, I.; Benedict, J.J.; Beare, D.J.	Regional Environmental Change	2018	10.1007/s10113-017-1242-1	1	1	n.a.
1	Natural disasters, social protection, and risk perceptions	Brown, P.; Daigneault, A.J.; Tjernstrom, E.; Zou, W.B.	World Development	2018	10.1016/j.worlddev.2017.12.002	1	2	We add to this field by studying the impact of being struck by the December 2012 Cyclone Evan on Fijian households' risk attitudes and subjective expectations about the likelihood and severity of natural disasters over the next 20 years.
1	Climate Change Awareness and Adaptations Among the Farming and Animal Rearing Communities of the Central Sokoto Close-Settle Zone, North-Western Nigeria	Jibrillah, A.M.; Jaafar, M.; Choy, L.K.	Jurnal Kejuruteraan	2018	10.17576/jkukm-2018-si1(6)-09	1	1	n.a.
1	Historically evolved practices of the Himalayan transhumant pastoralists and their implications for climate change adaptation	Aryal, S.; Panthi, J.; Dhakal, Y.R.; Gaire, N.P.; Karki, K.; Joshi, N.R.	International Journal of Global Warming	2018	10.1504/IJGW.2018.090402	1	1	n.a.
10	Comparing perceived effects of climate-related environmental change and adaptation strategies for the Pacific small island states of Tuvalu, Samoa, and Tonga	Beyerl, K.; Mieg, H.A.; Weber, E.	Island Studies Journal	2018	10.24043/isj.53	1	1	n.a.
3	Smallholder farmers' perception of climatic and socio-economic factors influencing livelihoods in the transition zone of Ghana	Derkyi, M.,;Adiku, S. G.; Nelson, V.; Delali Dovie, B.; Codjoe, S.; Awuah, E.	AAS Open Research	2018	10.12688/aasopenres.12839.1	1	1	n.a.
3	Effect of climate change in paddy production and adaptation strategies in Tharu communities of Dang district, Nepal.	Poudel, P. R.; Joshi, N. R.; Pokhrel, S.	Journal of Agriculture and Natural Resources	2018	10.3126/janr.v1i1.22223	1	1	n.a.
3	Perception analysis of climate change and adaptations by smallholder farmers in Nepal	Ghimire, N. P.; Aryal, M.; Regmi, P. P.; Thapa, R. B.; Pande, K. R.; Pant, K. P.	Journal of Agriculture and Environment	2018	10.3126/aej.v17i0.19866	1	1	n.a.
3	Climate Change Perception Among the Pastoralist Women in Narok County	Mashara, J. N.	Academic Research International	2018		1	1	n.a.
3	Socio-economic Impacts of Climate Change on Smallholder Livelihoods in Shashogo District, Hadiya Zone, South Ethiopia	Ludago, S. C.	Journal of Environment and Earth Science	2018		1	1	n.a.
3	Knowledge and perception of climate change among peasant farmers in a forest-savannah transition zone of Odo-Otin Area of Osun State	Samuel, K. J.; Adeniyi, S. A.; Adetunji, K.	African Journal of Sustainable Development	2018		1	1	n.a.
3	Farmers' Perceptions of Climate Change and Its Effects on Tree Cover in the Drylands of South Eastern Kenya: The Case of Matungulu Sub-County, Machakos County	Mutuku, H. M.; Kungu, J. B.; Mburu, B. K.	Journal of Natural Sciences Research	2018		1	1	n.a.
3	Do Smallholder Farmers Perceive Rainfall Variability the Same and Correctly? Gendered and Spatial Analysis of Perception Versus Actual Trends of Rainfall in Three Livelihood Zones in Kenya	Kiumbuku, S. K.; Baaru, M. W.; Mutinda, J. W.	Journal of Environment and Earth Science	2018		1	1	n.a.
1	Has the Environment Changed - What Can Be Done to Help the Fishermen Community? The Views of the Small Scale Fishermen in Malaysia	Idris, K.; Muhammad, M.; Abu Samah, A.; Suandi, T.; Shaffril, H.A.M.	Pertanika Journal Of Social Science And Humanities	2018		1	1	n.a.

Apêndice G - Lista completa dos artigos excluídos na etapa de filtragem por título e resumo, juntamente com os motivos da exclusão.

Column descriptions	
source	Database where the article was published (see codebook)
title	Title of the article
author	Author(s) of the article
journal	Journal where the article was published
year	Year of the article was published
DOI	DOI of the article
reason	If the article is not selected, select the reason: 1 = small-scale populations that moved to urban areas 2 = extensive rural properties, such as those dedicated to commercial monoculture directed towards commodity markets (e.g., agribusiness). 3 = not about small-scale populations 4 = not about climate change perception or awareness 5 = not about climate change 6 = urban area 7 = other thematic (e.g., agent-based modelling, energy, types of flood-based farming systems, invasora species, willingness to pay) 8 = non-primary data 9= does not describe study location. 10= book
why	Write the reason for the article being deleted.

source	title	author	journal	year	doi	reason	why
2	Modelling the potential risk zone of Lantana camara invasion and response to climate change in eastern India	Tiwari, S.; Mishra, S. N.; Kumar, D.; Kumar, B.; Vaidya, S. N.; Ghosh, B. G.; Rahaman, S.M.; Khatun, M.; Garai, S.; Kumar, A.	Ecological Processes	2022	10.1186/s13717-021-00354-w	4	Invasora specie (L. camara)
2	Role of institutional factors in climate-smart technology adoption in agriculture: Evidence from an Eastern Indian state	Tanti, P.C.; Jena, P.R.; Aryal, J.P.; Rahut, D.B.	Environmental Challenges	2022	10.1016/j.envc.2022.100498	4	This study uses primary data collected from 248 farm households in the Eastern Indian state of Odisha to examine the role of institutional factors in CSA adoption.
2	Perceived effects of COVID-19 restrictions on smallholder farmers: Evidence from seven lower- and middle-income countries	Hammond, J.; Siegal, K.; Milner, D.; Elimu, E.; Vail, T.; Cathala, P.; Gatera, A.; Karim, A.; Lee, J.-E.; Douxchamps, S.; Tu, M.T.; Ouma, E.; Lukuyu, B.; Lutakome, P.; Leitner, S. Wanyama I.; Thi, T.P.; Phuc, P.T.H.; Herrero, M.; van Wijk, M.	Agricultural Systems	2022	10.1016/j.agsy.2022.103367	4	The objectives are to describe: i) how farmers perceive the key effects of the COVID-19 pandemic and containment measures on livelihoods and food security; ii) the effects on agricultural activities; iii) the coping strategies households deployed.
6	Local perceptions of changes in mangrove ecosystem services and their implications for livelihoods and management in the Rufiji Delta, Tanzania	Nyangoko, B. P.; Berg, H.; Mangora, M. M.; Shalli, M. S.; Gullström, M.	Ocean & Coastal Management	2022	10.1016/j.ocecoaman.2022.106065	4	This study was set to explore how local communities in the Rufiji Delta, situated in central coastal Tanzania, perceived the status and trends in mangrove ecosystem services (MES), associated drivers of change and the impacts of changes in MES on local livelihoods.
6	Adaptation Strategies to Climate Change and Impacts on Household Income and Food Security: Evidence from Sahelian Region of Niger	Zakari, S.; Ibro, G.; Moussa, B.; Abdoulaye, T.	Sustainability (Switzerland)	2022	10.3390/su14052847	4	This paper examines the factors influencing climate change adaptation strategies and the impacts on household income and food security in rural Niger.
6	Stakeholders' perceptions of factors influencing climate change risk in a Central America hotspot	Feliciano, D.; Sobenes, A.	Regional Environmental Change	2022	10.1007/s10113-022-01885-4	3	Does not mention smallholders. Perceptions of factors affecting climate change risk are assessed between different types of stakeholders.
6	Identifying drivers of adaptive behavior among livestock breeders in Varamin County, Iran: an exploratory sequential mixed-methods approach	Ahmadi, M.; Najafabadi, M.O.; Motamedvaziri, B.	Regional Environmental Change	2022	10.1007/s10113-022-01890-7	4	The aim of this research is to investigate behavioral adaptation to climate change among livestock breeders in Iran by using an exploratory sequential mixed-methods approach. Considering the different effects of climate change in Varamin city, one of the most important livestock ecosystems in Iran, design of an adaptation pattern to climate change for livestock breeders in this region is necessary.
6	Daily monitoring of marine mucilage using the MODIS products: a case study of 2021 mucilage bloom in the Sea of Marmara, Turkey	Yagci, A.L.; Colkesen, I.; Kavzoglu, T.; Sefercik, U.G.	Environmental Monitoring and Assessment	2022	10.1007/s10661-022-09831-x	4	In this research, daily monitoring and detection of mucilage formations from the coarse spatial resolution MODIS products were investigated during the 2021 bloom period.
2	Landscape ecological risk projection based on the PLUS model under the localized shared socioeconomic pathways in the Fujian Delta region	Zhang, S.; Zhong, Q.; Cheng, D.; Xu, C.; Chang, Y.; Lin, Y.; Li, B.	Ecological Indicators	2022	10.1016/j.ecolind.2022.108642	4	We employed patch-generating land use simulation (PLUS) model coupled with multiple linear regression and a Markov chain model to project the landscape patterns in 2050. The Shared Socioeconomic Pathways (SSPs) proposed by the Intergovernmental Panel on Climate Change (IPCC) were selected as the scenario framework. Thus, the spatiotemporal characteristics of the landscape pattern changes and LER from 2000 to 2020 and the projections for 2050 under different localized SSPs scenarios were explored.
2	Users' views on cultural ecosystem services of urban parks: An importance-performance analysis of a case in Beijing, China	Gai, S.; Fu, J.; Rong, X.; Dai, L.	Anthropocene	2022	10.1016/j.ancene.2022.100323	6	Study in an urban park in Wudaokou.
11	Smallholder farmers' willingness to pay for flood insurance as climate change adaptation strategy in northern Bangladesh	Hossain, M.S.; Alam, G.M.M.; Fahad, S.; Sarker, T.; Moniruzzaman, M.; Rabbany, M.G.	Journal of Cleaner Production	2022	10.1016/j.jclepro.2022.130584	4	In order to ascertain farmers' risk behavior towards flood and their willingness to pay (WTP) for flood insurance as a strategy for climate change adaptation and agricultural sustainability, this study employed survey data collected from 480 flood-affected farm households in northern Bangladesh with experiment-based risk preference and subjective risk perception data. Farmers' flood risk perceptions and attitude were assessed through risk matrix and ELCE technique (equally likely certainty equivalent) and used as independent variables in a probit regression model. Farmers' WTP decisions were found to be influenced by a variety of factors, including land ownership status, off-farm income, flood experience, farmers' group and access to information and extension services.
6	Conservation of the coral community and local stakeholders' perceptions of climate change impacts: Examples and gap analysis in three Japanese national parks	Abe, H.; Mitsui, S.; Yamano, H.	Ocean and Coastal Management	2022	10.1016/j.ocecoaman.2022.106042	3	The objectives of this study were to determine the status of coral conservation/management from websites and reports, and to clarify perceptions/concerns about climate change impacts through interviews with local stakeholders.
6	Determinants of crop choice decisions under risk: A case study on the revival of cocoa farming in the Forest-Savannah transition zone of Ghana	Hashmiu, I.; Agbenyega, O.; Dawoe, E.	Land Use Policy	2022	10.1016/j.landusepol.2021.105958	3	The revival of cocoa farming in the Forest-Savannah Transition Zone (FSTZ) of Ghana despite high production risk raises questions on the factors underlying it, and whether the renewed interest in cocoa can be sustained. This paper examines the reasons that underlie households' decision to farm cocoa or otherwise in the FSTZ, and how risk perceptions, demographic factors and livelihood assets predict such crop choice decisions.
6	Statistically examining the connection between dike development and human perceptions in the floodplains' socio-hydrology system of Vietnamese Mekong Delta	Luu, T.; Verhallen, M.; Tran, D.D.; Sea, W.B.; Nguyen, T.B.; Nguyen, H.Q.	Science of the Total Environment	2022	10.1016/j.scitotenv.2021.152207	4	This study aims to better understand the co-evolution of human-water systems in floodplains.
6	A photovoice assessment for illuminating the role of inland fisheries to livelihoods and the local challenges experienced through the lens of fishers in a climate-driven lake of Malawi	Simmance, F.A.; Simmance, A.B.; Kolding, J.; Schreckenberg K.; Tompkins E.; Poppy, G.; Nagoli, J.	Ambio	2022	10.1007/s13280-021-01583-1	4	This study adopts a Sustainable Livelihoods Approach and investigates how important a fluctuating inland fishery is to livelihoods, and how local perceptions on challenges corresponds to global evidence. The findings illuminate the valuable role of the sector to food and nutrition security and the complex nexus with vulnerability to climate change.

6	Towards circular phosphorus: The need of inter- and transdisciplinary research to close the broken cycle	Stamm, C.; Binder, C.R.; Frossard, E.; Haygarth P.M.; Oberson A.; Richardson A.E.; Schaum C.; Schoumans, O.; Udert, K.M.	Ambio	2022	10.1007/s13280-021-01562-6	4	This paper presents outcomes from the 9th International Phosphorus Workshop (IPW9) held 2019 on how to move towards a sustainable phosphorus management.
11	Vulnerability perception, quality of life, and indigenous knowledge: A qualitative study of the population of Ngamiland West District, Botswana	Dintwa, K.F.; Letamo, G.; Navaneetham, K.	International Journal of Disaster Risk Reduction	2022	10.1016/j.ijdrr.2022.102788	4	This study is aimed at investigating natural hazards vulnerability perceptions, as well as to explore Indigenous Knowledge Systems (IKS) important in climate change adaptation and disaster risk reduction in Ngamiland West District. The study also investigated the impact of the 2009/10 floods on the livelihoods of the people of Etsha-13 Village.
10	Topical Analysis of Nuclear Experts' Perceptions of Publics, Nuclear Energy, and Sustainable Futures	Patenaude, H.K.; Bloomfield, E.F.	Frontiers in Communication	2022	10.3389/fcomm.2022.762101	3	This study explores the perspectives of experts and how they make sense of their own communicative practices through a topical analysis of semi-structured interviews with 12 nuclear scientists and engineers in the United States and Canada.
2	Prior crop season management constrains farmer adaptation to warming temperatures: Evidence from the Indo-Gangetic Plains	Ishtiaque, A.; Singh, S.; Lobell, D.; Balwinder-Singh; Fishman, R.; Jain, M.	Science of the Total Environment	2022	10.1016/j.scitotenv.2021.151671	2	Study about rice crop and wheat sowing across the Indo-Gangetic Plains (IGP) of India.
6	A National Status Report on United States Coral Reefs Based on 2012–2018 Data From National Oceanic and Atmospheric Administration's National Coral Reef Monitoring Program	Towle, E.K.; Donovan, E.C.; Kelsey, H.; Allen, M.E.; Barkley, H.; Blondeau, J.; Brainard, R.E.; Carew, A.; Couch, C.S.; Dillard, M.K.; Eakin, C.M.; Edwards, K.; Edwards, P.E.T.; Enochs, I.C.; Fleming, C.S.; Fries, A.S.; Geiger, E.F.; Grove, L.J.; Groves, S.H.; Gorstein, M.; Heenan, A.; Johnson, M.W.; Kimball, J.; Koss, J.L.; Kindinger, T.; Levine, A.; Manzello, D.P.; Miller, N.; Oliver, T.; Samson, J.C.; Swanson, D.; Vargas-Ángel, B.; Viehman, T.S.; Williams, I.D.	Frontiers in Marine Science	2022	10.3389/fmars.2021.812216	4	Article about: National Oceanic and Atmospheric Administration's Coral Reef Conservation Program supports the National Coral Reef Monitoring Program (NCRMP) in the United States Pacific, Atlantic, Caribbean, and Gulf of Mexico.
2	Perception and adaptation strategies of dairy farmers towards climate variability and change in West Africa	Montcho, M.; Padonou, E.A.; Montcho, M.; Mutua, M.N.; Sinsin, B.	Climatic Change	2022	10.1007/s10584-022-03311-4	3	The main objective of this study is to investigate dairy farmers' perceptions and adaptation strategies towards climate variability and change in West Africa.
2	Accounting for local temperature effect substantially alters afforestation patterns	Windisch, M.G.; Humpenöder, F.; Lejeune, Q.; Schleussner, C.-F.; Lotze-Campen, H.; Popp, A.	Environmental Research Letters	2022	10.1088/1748-9326/ac4f0e	4	We combine the benefit of CO2 sequestration of afforestation/reforestation (A/R) with the additional incentive or penalty of local BGP induced cooling or warming by translating the local BGP induced temperature change to a CO2 equivalent. We then include this new aspect in the land-use model Model for Agricultural Production and their Impact on the Environment (MAgPIE) via modifying the application of the price on greenhouse gases (GHGs).
6	Embedding the integrated assessment of agricultural systems in a companion modeling process to debate and enhance their sustainability	Hossard, L.; Tardivo, C.; Barbier, J.-M.; Cittadini, R.; Delmotte, S.; Le Page, C.	Agronomy for Sustainable Development	2022	10.1007/s13593-021-00744-6	4	Our research question was: to what extent does the joint use of these two methods foster sustainability thinking? We show how the co-design of evolving agriculture scenarios and the use of Integrated Assessment of Agricultural Systems methods guided the implementation of a Companion Modeling process applied to the Valensole Plateau, southeastern France.
6	Analysis of Regulatory Possibilities and Obstacles to Expand Renewable Energy and Preserve Landscape Quality in the Silesian Voivodship	Szumilas-kowalczyk, H.; Giedych, R.	Resources	2022	10.3390/resources11020023	4	This research focuses on the question of how and where renewable energy development is planned in the Silesian Voivodship, based on provisions from local spatial polices and to what extent post-mining and industrial sites are planned to be reused and how many other types of landscapes would be transformed into renewable energy landscapes.
6	Carbon Management behind the Ambitious Pledge of Net Zero Carbon Emission—A Case Study of PepsiCo	Qian, D.; Dargusch, P.; Hill, G.	Sustainability (Switzerland)	2022	10.3390/su14042171	4	As one of the largest and most influential international food and beverage companies with a range of well-known brands, PepsiCo has made ambitious commitments to science-based climate goals, including reducing GHG emissions from its direct operations by 75% against the 2015 baseline and reducing GHG emissions across its indirect value chain by 40% by 2030, as well as setting an ambitious new target to achieve net-zero emissions by 2040. PepsiCo has incorporated carbon reduction and climate strategies in all focus areas across its value chain, accelerating its work on broadening the scale of sustainable agriculture and regenerative farming practice; reducing plastic use and increasing the use of recycle and renewable materials as well as adopting low-carbon alternatives; developing efficient and alterna-tive solutions in transportation and distribution; shifting to renewable electricity and fuels in man-ufacturing and fleet.
6	Farmers' Attitudes towards Irrigating Crops with Reclaimed Water in the Framework of a Circular Economy	López-Serrano, M.J.; Velasco-Muñoz, J.F.; Aznar-Sánchez, J.A.; Román-Sánchez, I.M.	Agronomy	2022	10.3390/agronomy12020435	4	For this research 231 farmers, both long-time users of reclaimed water and non-users, were surveyed to find common and differing attitudes and perceptions. Results show how once farmers start irrigating their crops with this alternative resource there is a marked improvement in their opinion.
6	Finnish dairy farmers' perceptions of justice in the transition to carbon-neutral farming	Puupponen, A.; Lonkila, A.; Savikurki, A.; Karttunen, K.; Huttunen, S.; Ott, A.	Journal of Rural Studies	2022	10.1016/j.jrurstud.2022.01.014	3	This study examines the experiences and perceptions of dairy farmers in Finland.
6	Income Change and Inter-Farmer Relations through Conservation Agriculture in Ishikawa Prefecture, Japan: Empirical Analysis of Economic and Behavioral Factors	Miyake, Y.; Kimoto, S.; Uchiyama, Y.; Kohsaka, R.	Land	2022	10.3390/land11020245	4	To understand the effect of conservation agriculture on farmers and identify those factors, such as farmers' income change, that might affect practices of conservation agriculture, perceptions, and output, this study examined farmers' economic and behavioral factors, motivation, and satisfaction.
2	Temperature Variation and Climate Resilience Action within a Changing Landscape	Marajh, L.; He, Y.	Remote Sensing	2022	10.3390/rs14030701	3	This study examines local temperature across three different land types (rural mountains, rural agricultural lowlands, urban areas) in the Greater Angkor Region of Cambodia to highlight important insights about temperature and climate resilience action.
10	Salinity Constraints for Small-Scale Agriculture and Impact on Adaptation in North Aceh, Indonesia	Dewi, E.S.; Abdulai, I.; Bracho-Mujica, G.; Rötter, R.P.	Agronomy	2022	10.3390/agronomy12020341	4	We investigated the perceived effects of salinity on farming practices, income, and challenges for crop production in Blang Nibong village in North Aceh, Indonesia.
2	Risk and reward of the global truffle sector under predicted climate change	Čejka, T.; Isaac, E.L.; Oliach, D.; Martínez-Pea F.; Egli S.; Thomas P.; Trnka, M.; Büntgen, U.	Environmental Research Letters	2022	10.1088/1748-9326/ac47c4	4	Study about truffles

6	Assessing climate and human activity effects on lake characteristics using spatio-temporal satellite data and an emotional neural network	Mojtahedi, A.; Dadashzadeh, M.; Azizkhani, M.; Mohammadian, A.; Almasi, R.	Environmental Earth Sciences	2022	10.1007/s12665-022-10185-3	3	The objective of this study is to evaluate the Lake Urmia crisis concerning human-involved and climate factors such as the agriculture sector and construction of the causeway.
6	Lessons learned from a natural resource disaster: The long-term impacts of the Long Island Sound lobster die-off on individuals and communities	Seara, T.; Owens, A.; Pollnac, R.; Pomeroy, R.; Dyer, C.	Marine Policy	2022	10.1016/j.marpol.2021.104943	6	Location: Long Island Sound American (between New York City and Connecticut, USA)
2	Place-based civic science—collective environmental action and solidarity for eco-resilience	Gallay, E.; Furlan Brighente, M.; Flanagan, C.; Lowenstein, E.	Child and Adolescent Mental Health	2022	10.1111/camh.12537	6	Population: students and public presentations of 6–12th graders.
6	How does rural labor migration affect crop diversification for adapting to climate change in the Hehuang Valley, Tibetan Plateau?	Zhang, Y.; Wu, Y.; Yan, J.; Peng, T.	Land Use Policy	2022	10.1016/j.landusepol.2021.105928	4	There is still a lack of case studies that address how labor migration affects crop diversification. To fill in this gap, we first propose a theoretical framework to address the impact of labor migration on crop diversification under the background of climate change; then, with the data collected from 499 households in the Hehuang Valley (HV), Tibetan Plateau, we explore the factors influencing crop diversification by employing Tobit model.
6	Quantifying the contribution of diminishing green spaces and urban sprawl to urban heat island effect in a rapidly urbanizing metropolitan city of Pakistan	Arshad, S.; Ahmad, S.R.; Abbas, S.; Asharf A.; Siddiqui, N.A.; Islam, Z.U.	Land Use Policy	2022	10.1016/j.landusepol.2021.105874	6	This study aims to analyze urban policies impacts by quantifying built-up land, green spaces and their associated SUHI effects in the Lahore district of Pakistan.
12	Narrative Matters: Fighting not drowning – facing a harsh climate future with wisdom, hope and courage	Wiseman, J.	Child and Adolescent Mental Health	2022	10.1111/camh.12523	3	This article explores diverse sources of learning and wisdom – from climate scientists and activists; philosophers and social theorists; Indigenous cultures and ways of life; faith-based and spiritual traditions; artists and writers – which can strengthen our capacity to live courageous, compassionate and creative lives in a world of rapidly accelerating climatic and ecological risk.
6	Determinants of Adaptation to Climate Change: A Case Study of Rice Farmers in Western Province, Iran	Jamshidi, A.; Jamshidi, M.; Abadi, B.	Chinese Geographical Science	2022	10.1007/s11769-021-1246-0	2	Rice production in monocultures.
6	On the development of a regional climate change adaptation plan: Integrating model-assisted projections and stakeholders' perceptions	Gonçalves, C.; Honrado, J.P.; Cerejeira, J.; Sousa R.; Fernandes P.M.; Vaz A.S.; Alves M.; Araújo M.; Carvalho-Santos C.; Fonseca A.; Fraga H.; Gonçalves J.F.; Vicente, J.R.; Santos, J.A.	Science of the Total Environment	2022	10.1016/j.scitotenv.2021.150320	6	Location: Tâmega and Sousa Region, a mountainous inter-municipal community in the North of Portugal.
10	Farmers' Perceptions of the Effects of Extreme Environmental Changes on Their Health: A Study in the Semiarid Region of Northeastern Brazil	Magalhães, H.F.; Feitosa, I.S.; Araújo, E.D.L.; Albuquerque, U.P.	Frontiers in Environmental Science	2022	10.3389/fenvs.2021.735595	4	Our study investigated the perception of diseases by farmers living in the semiarid region of Northeastern Brazil and the adaptive strategies locally developed and used.
6	Agent-based modelling to simulate farmers' sustainable decisions: Farmers' interaction and resulting green consciousness evolution	Marvuglia, A.; Bayram, A.; Baustert, P.; Gutiérrez, T.N.; Igos, E.	Journal of Cleaner Production	2022	10.1016/j.jclepro.2021.129847	4	This paper describes the application of a coupled (Agent-based modelling)ABM-LCA model to simulate cropping activities in the Grand Duchy of Luxembourg.
6	Farmer perceptions of climate change and adaptation during the 2017–2020 Australian drought	Miller, G.; MacNeil, R.	Australian Journal of Political Science	2022	10.1080/10361146.2022.2049206	3	Does not mention smallholders. This paper aims to understand how the experience of an extreme climate event like the 2017–2020 drought might shift opinions and values on these issues within agricultural communities. Through in-depth interviews with 20 graziers across Northwest NSW
6	Perceived social-ecological benefits of insect pollinators in Mufulira mining district of Zambia	Mulwanda, C.; Nyirenda, V.R.; Namukonde, N.	International Journal of Tropical Insect Science	2022	10.1007/s42690-022-00759-w	4	In this study, we examined perceived contribution of insect pollinators to Murundu farming community as a case study, using semi-structured household questionnaire, focused group discussions and interviews of informants. The study revealed a mix of perceptions regarding the socio-ecological benefits of insect pollinators, and among them were crop pollination, honey and fruit production.
6	Assessing social vulnerability to riverbank erosion across the Vietnamese Mekong Delta	Tri, V.P.D.; Trung, P.K.; Trong, T.M.; Parsons , D.R.; Darby, S.E.	International Journal of River Basin Management	2022	10.1080/15715124.2021.2021926	4	This study investigated the drivers, and classified the social vulnerability of local communities affected by riverbank erosion along two main branches in the Vietnamese Mekong. D
6	Exploring smallholder farmers' climate adaptation decision-making in mountainous areas of Central Vietnam: implications for extension services	Hoa Sen, L.T.; Bond, J.; Hoang, H.D.T.	Journal of Agricultural Education and Extension	2022	10.1080/1389224X.2022.2039248	4	Purpose: To explore smallholder farmers' decision-making for climate adaptation in the mountainous areas of Central Vietnam, in order to target extension efforts.
6	Climate change in public health and medical curricula in Australia and New Zealand: a mixed methods study of educator perceptions of barriers and areas for further action	Lal, A.; Walsh, E.I.; Wetherell, A.; Slimings, C.	Environmental Education Research	2022	10.1080/13504622.2022.2036325	3	Educators identified by their coordination, convenorship, or delivery into programs of public health and medicine at universities in Australia and New Zealand were invited to participate in a cross-sectional, exploratory mixed methods study to examine the design and delivery of climate change content in the curricula, and the barriers and opportunities for better integration.
6	Implementation of the UN sustainable development goals in the agri-food system of Russia: regional and sectoral features	Cherednichenko, O.; Dovgotko, N.; Rybasova, Y.; Vorontsova, G.; Momotova, O.	International Journal of Sustainable Development and World Ecology	2022	10.1080/13504509.2022.2040635	4	The article views regional and sectoral peculiarities of Agenda-2030 realization in Russian agricultural sector. The aim of the research was to determine the degree of the SDGs achievement in agribusiness on national, regional and local levels in the absence of quantitative markers.
6	The nexus of traditional knowledge and climate change adaptation: Romanian farmers' behavior towards landraces	Petrescu-Mag, R.M.; Petrescu, D.C.; Muntean, O.-L.; Petrescu-Mag, I.V.; Radu Tenter, A.; Azadi, H.	Local Environment	2022	10.1080/13549839.2022.2033966	3	Does not mention smallholders. The present study heightens our understanding of the Romanian farmers' perceptions of climate change, their actual on-farm adaptation measures, and the driving and constraint factors towards their decision to cultivate LRs.
6	Defining drought from the perspective of Australian farmers	Hughes, N.; Soh, W.Y.; Boult, C.; Lawson, K.	Climate Risk Management	2022	10.1016/j.crm.2022.100420	3	This study examines drought from the perspective of farm businesses in order to develop new outcome-based drought indicators.

10	Exploring integrated ArtScience experiences to foster nature connectedness through head, heart and hand	Renowden, C.; Beer, T.; Mata, L.	People and Nature	2022	10.1002/pan3.10301	4	Here, we explore an art-based approach to science communication and nature connectedness through a series of participatory ArtScience workshops. These workshops were delivered at The Living Pavilion, an Indigenous-led, temporary event space that took place in Melbourne, Australia.
6	Alternative Conservation Paradigms and Ecological Knowledge of Small-Scale Artisanal Fishers in a Changing Marine Scenario in Argentina	Truchet, D.M.; Noceti, B.M.; Villagran, D.M.; Truchet, R.M.	Human Ecology	2022	10.1007/s10745-022-00309-5	4	We studied conservation paradigms of small-scale artisanal fishers and other actors involved in the conservation of the Bahía Blanca Estuary (BBE)—a Southwestern Atlantic estuary under anthropogenic pressures (conservationists, NGOs, individuals in the private sector and the port consortium).
2	Lighting, density, and dietary strategies to improve poultry behavior, health, and production	El-Sabrout, K.; El-Deek, A.; Ahmad, S.; Usman, M.; Tavares Dantas, M.R.; Freire Souza-Junior, J.B.	Journal of Animal Behaviour and Biometeorology	2022	10.31893/jabb.22012	4	Study about: Poultry production industry.
6	Crop mix portfolio response to climate risks: evidence from smallholder farmers in Kisumu County, Kenya	Awiti, H.A.; Gido, E.O.; Obare, G.A.	Agrekon	2022	10.1080/03031853.2022.2028642	3	We use primary data from 267 randomly selected respondents and apply a multinomial logit model to test the hypothesis that crop portfolio choice is an ex-ante mechanism to manage climate risks in the absence of crop insurance.
6	Can ensemble machine learning be used to predict the groundwater level dynamics of farmland under future climate: a 10-year study on Huaibei Plain	Jiang, Z.; Yang, S.; Liu, Z.; Xu, Y.; Shen, T.; Qi, S.; Pang, Q.; Xu, J.; Liu, F.; Xu, T.	Environmental Science and Pollution Research	2022	10.1007/s11356-022-18809-8	4	Based on the GWL and meteorological data of five monitoring wells (N1, N2, N3, N4, and N5) in Huaibei plain from 2010 to 2020, the feasibility of predicting GWL by meteorological factors and ML algorithm was tested.
6	The short- and long-term impacts of climate change on the irrigated barley yield in Iran: an application of dynamic ordinary least squares approach	Azizi, J.; Zarei, N.; Ali, S.	Environmental Science and Pollution Research	2022	10.1007/s11356-022-19046-9	4	The present study aims to explore the short- and long-term impacts of climate change on the yield of irrigated barley in 28 Iranian provinces over the 1999–2015 period.
6	The persuasiveness of gain vs. loss framed messages on farmers' perceptions and decisions to climate change: A case study in coastal communities of Vietnam	Ngo, C.C.; Poortvliet, P.M.; Klerkx, L.	Climate Risk Management	2022	10.1016/j.crm.2022.100409	6	The research was conducted in a suburban farming community of Quy Nhon city, Binh Dinh province, located in the south-central coast of Vietnam
6	Household external vulnerability due to climate change in Selangor coast of Malaysia	Ehsan, S.; Ara Begum, R.; Nizam Abdul Maulud, K.	Climate Risk Management	2022	10.1016/j.crm.2022.100408	4	This study attempted to evaluate vulnerability mapping of the coastal areas due to climate change using an integrative external and internal framework from three dimensions at the household level: exposure (E) to coastal hazards, sensitivity (S) due to demographic, socio-economic and structural characteristics and adaptive capacity (AC) relating to available assets and adaptive behaviour to cope with climate change impacts. P
6	Exploring farmers' perception of climate-induced events and adaptation practices to protect crop production and livestock farming in the Haor area of north-eastern Bangladesh	Fahim, T.C.; Sikder, B.B.	Theoretical and Applied Climatology	2022	10.1007/s00704-021-03907-3	3	Does not mention smallholders.
2	Farmers' Knowledge Level Regarding Climate Smart Agricultural Pro-duction Technologies in Central Plain Valley of Khyber Pakhtunkhwa	Farooq, A.; Hassan, A.; Ishaq, M.; Nawaz, A.; Ullah, I.; Hidayatullah.	Sarhad Journal of Agriculture	2022	10.17582/JOURNAL.SJA/2022/38.1.331.341	6	The current study was carried out in two districts Charsadda and Nowshera of Khyber Pakhtunkhwa
6	Adaptation to Social–Ecological Change in Northwestern Pakistan: Household Strategies and Decision-making Processes	Nixon, R.; Ma, Z.; Zanotti, L.; Khan B.; Birkenholtz T.; Lee, L.; Mian, I.	Environmental Management	2022	10.1007/s00267-021-01583-7	3	We drew on 25 semi-structured interviews with community leaders, farmers, fisherfolk, and individuals in the tourism industry in northwestern Pakistan
6	Assessment of agricultural emissions, climate change mitigation and adaptation practices in Ethiopia	Feliciano, D.; Recha, J.; Ambaw, G.; MacSween, K.; Solomon, D.; Wollenberg, E.	Climate Policy	2022	10.1080/14693062.2022.2028597	3	Does not mention smallholders. Perceptions of factors afecting climate change risk are assessed between diferent types of stakeholders.
6	Assessment of evidence-based climate variability in Bhagirathi sub-basin of India: a geostatistical analysis	Rehman, S.; Sajjad, H.; Masroor, M.; Rahaman M.H.; Roshani; Ahmed, R.; Sahana, M.	Acta Geophysica	2022	10.1007/s11600-022-00726-6	3	This study makes an attempt to analyse climate variability in the Bhagirathi Sub-basin of India. Six meteorological variables were analysed from fourteen weather stations located in the Sub-basin during 1968–2017. A total of 432 households were selected for reaffirming climate variability and impact on landscape.
6	Smart Greenhouse Monitoring System Using Internet of Things and Artificial Intelligence	Soheli, S.J.; Jahan, N.; Hossain, M.B.; Adhikary A.; Khan, A.R.; Wahiduzzaman, M.	Wireless Personal Communications	2022	10.1007/s11277-022-09528-x	4	Study is about a modern greenhouse maintenance system.
6	Integrated watershed modeling using interval valued fuzzy computations to enhance watershed restoration and protection at field-scale	Srinivas, R.; Das, B.; Singhal, A.	Stochastic Environmental Research and Risk Assessment	2022	10.1007/s00477-021-02151-5	4	Study about Watershed models.
6	To Be, to Do, to Share: The Triple-Loop of Water Governance to Improve Urban Water Resilience—Testing the Benidorm' Experience, Spain	Ricart, S.; Rico-Amorós, A.M.	Land	2022	10.3390/land11010121	6	Location: Marina Baja county in southern Spain.
6	Farmers' Strategies to Climate Change and Urbanization: Potential of Ecosystem-Based Adaptation in Rural Chengdu, Southwest China	Zhong, B.; Wu, S.; Sun, G.; Wu, N.	International Journal of Environmental Research and Public Health	2022	10.3390/ijerph19020952	6	Location: Chengu is a metropolitan area, is not only the capital of the Sichuan Province in southwest China, but it is also the most important economic, commercial, cultural and transportation hub in western China.
2	Assessment of Flood Risk Map under Climate Change RCP8.5 Scenarios in Taiwan	Chen, Y.-J.; Lin, H.-J.; Liou, J.-J.; Cheng, C.-T.; Chen, Y.-M.	Water (Switzerland)	2022	10.3390/w14020207	6	Location: Taiwan
10	Barriers for Renewable Energy Technologies Diffusion: Empirical Evidence from Finland and Poland	Juszczyk, O.; Juszczyk, J.; Juszczyk, S.; Takala, J.	Energies	2022	10.3390/en15020527	4	In this study, we explored multifarious barriers for widespread enewable energy technologies (RETs) diffusion in two European Union countries, Finland and Poland.

6	Climate change and its influence on planting of cassava in the Midwest region of Brazil	de Olanda Souza, G.H.; de Oliveira Aparecido, L.E.; de Moraes, J.R.S.C.; Botega, G.T.	Environment, Development and Sustainability	2022	10.1007/s10668-021-02088-3	4	The objective of the study is to carry out the agroclimatic zoning of cassava (Manihot esculenta Crantz) for the Midwest region of Brazil in future scenarios of climate change.
6	Willingness to pay for the ecological restoration of an inland freshwater shallow lake: case of Lake Malombe, Malawi	Makwinja, R.; Mengistou, S.; Kaunda, E.; Alamirew, T.	Heliyon	2022	10.1016/j.heliyon.2021.e08676	4	This study applied the contingent valuation method (CVM) and binary logistic regression model to determine the public's willingness to pay (WTP) for ecosystem restoration and the influencing factors. The aim was to integrate science into policy framework to achieve a sustainable flow of ecosystem services (ESs).
6	Empirical use of fly ash for rhizobial population and yield of some legume crops for sustainable agriculture	Kumar, K.; Kumar, A.	Biomass Conversion and Biorefinery	2022	10.1007/s13399-021-02058-9	4	The main objective of this work was to use pollutant as fertilizer under skilled jurisdiction. The present work was completed to check the impact of Fly ash (FA) on Rhizobium population, nitrogen fixation efficiency, and productivity of Vigna mungo, V. radiata, and V. unguiculata crops.
6	Inventory and drivers of the adoption of flood-based farming systems in South-Eastern Africa: Insights from Malawi*	Msume, A.P.; Mwale, F.D.; Castelli, G.	Irrigation and Drainage	2022	10.1002/ird.2664	4	This study focuses on the Balaka District (Malawi) and the types of flood-based farming systems (FBFS) in use, the extent of practice, and the factors behind their adoption.
6	The role of gi products or local products in the environment—consumer awareness and preferences in albania, bulgaria and Poland	Muça, E.; Pomianek, I.; Peneva, M.	Sustainability (Switzerland)	2022	10.3390/su14010004	3	The main goal of this paper is to measure and compare the awareness and preferences of consumers in relation to local products in three countries: Albania, Bulgaria, and Poland.
6	Climate change-induced drought impacts, adaptation and mitigation measures in semi-arid pastoral and agricultural watersheds	Muralikrishnan, L.; Padaria, R.N.; Choudhary, A.K.; Dass A.; Shokralla S.; Zin El-Abedin T.K.; Abdelmohsen S.A.M.; Mahmoud, E.A.; Elansary, H.O.	Sustainability (Switzerland)	2022	10.3390/su14010006	3	Does not mention smallholders. Periodic drought is a major challenge in drought-prone areas of South Asia. A sample survey of farmers (n = 400) from South Asia was conducted to study the farmers' perception about drought impacts on their socio-economic status, agro-biodiversity, and adaptation besides public institutions' drought mitigation measures.
19	Usability of weather information services for decision-making in farming: Evidence from the Ada East District, Ghana	Sarku, R.; Van Slobbe, E.; Termeer, K.; Kranjac-Berisavljevic, G.; Dewulf, A.	Climate Services	2022	10.1016/j.cliser.2021.100275	4	The study examined farmers' perceptions about the usability of existing weather information services (WIS) for farming, focusing on the Ada East District in the Greater Accra Region in Ghana. We developed five information design and delivery criteria: local embeddedness, legitimacy, spatial and temporal resolution, predictive skill, and accessibility.
2	Farm factors influencing soil fertility management patterns in Upper Eastern Kenya	Mairura, F.S.; Musafiri, C.M.; Kiboi, M.N.; Macharia J.M.; Ng'etich O.K.; Shisanya C.A.; Okeyo J.M.; Okwuosa, E.A.; Ngetich, F.K.	Environmental Challenges	2022	10.1016/j.envc.2021.100409	4	We investigated patterns of multiple soil technology adoption using multivariate analysis and regression modeling in Central Kenya.
11	Food-security corridors: A crucial but missing link in tackling deforestation in Southwestern Ghana	Kumeh, E.M.; Bieling, C.; Birner, R.	Land Use Policy	2022	10.1016/j.landusepol.2021.105862	4	The study is about subsistence farmers and forest conversion to farms. This paper employs narrative policy analysis to disentangle the stories that underpin farming by forest-fringe communities (FFCs) in protected forests. The FFCs' narratives were identified through fieldwork in 12 forest communities of Southwestern Ghana and juxtaposed with forest regulators and cocoa sector actors' narrativization of forest conversion in Ghana.
28	Mapping risk factors to climate change impacts using traditional ecological knowledge to support adaptation planning with a Native American Tribe in Louisiana	Bethel, M.B.; Braud, D.H.; Lambeth, T.; Dardar, D.S.; Ferguson-Bohnee, P.	Journal of Environmental Management	2022	10.1016/j.jenvman.2021.113801	4	The primary goal for this study was to develop a decision-support tool that aids the PACIT in assessing local ecological change and associated risks to the Tribe's resilience. Using remote sensing datasts and geographic information systems (GIS) processes to represent aspects of the Tribe's TEK to achieve this goal, we developed methods for producing interactive maps that reflect local perceptions of landscape features within the Tribe's ecosystem-dependent livelihood base that contribute most to the community's physical vulnerability to coastal hazards.
2	Network organization of the plant immune system: from pathogen perception to robust defense induction	Delplace, F.; Huard-Chauveau, C.; Berthomé, R.; Roby, D.	Plant Journal	2022	10.1111/tpj.15462	4	Here, we review the recent progress made to understand the network complexity of regulatory pathways leading to plant immunity, from pathogen perception, through signaling pathways and finally to immune responses.
6	The Possibility of Consensus Regarding Climate Change Adaptation Policies in Agriculture and Forestry among Stakeholder Groups in the Czech Republic	Trnka, M.; Bartošová, L.; Grammatikopoulou, I.; Havlík P.; Olesen J.E.; Hlavinka P.; Marek M.V.; Vačkářová D.; Skjelvåg, A.; Žalud, Z.	Environmental Management	2022	10.1007/s00267-021-01499-2	3	This paper utilizes an interactive survey to (1) address the aforementioned gap in studies involving three groups of stakeholders and opinion makers and (2) perform a comparative primary study of the climate change assumptions, risk perceptions, policy preferences, observations, and knowledge of Czech farmers, governmental policy-makers and researchers.
6	Safflower-based biorefinery producing a broad spectrum of biofuels and biochemicals: A life cycle assessment perspective	Hosseinzadeh-Bandbafha H.; Nazemi F.; Khounani Z.; Ghanavati H.; Shafiei M.; Karimi K.; Lam S.S.; Aghbashlo M.; Tabatabaei M.	Science of the Total Environment	2022	10.1016/j.scitotenv.2021.149842	4	The study aims to assess the environmental sustainability of bioethanol production in a safflower-based biorefinery using the life cycle assessment framework.
6	A minority group's response to a severe climatic event: a case study of rural Indo-Fijians after Tropical Cyclone Winston in 2016	Nakamura, N.; Kanemasu, Y.	Disasters	2022	10.1111/disa.12462	4	This paper investigates the impacts of Tropical Cyclone Winston (2016) on rural Indo-Fijians and their response to the devastation.
2	In harm's way: Non-migration decisions of people at risk of slow-onset coastal hazards in Bangladesh	Mallick, B.; Rogers, K.G.; Sultana, Z.	Ambio	2022	10.1007/s13280-021-01552-8	4	We explore the leveraging factors of non-migration decisions of communities at risk in coastal Bangladesh, where exposure to both rapid- and slow-onset natural disasters is high. We apply the Protection Motivation Theory (PMT) to empirical data and assess how threat perception and coping appraisal influences migration decisions in farming communities suffering from salinization of cropland.
1	The influence of smartphone use on conservation agricultural practice: Evidence from the extension of rice-green manure rotation system in China	Li, F.D.; Yang, P.; Zhang, K.; Yin, Y.S.; Zhang, Y.N.; Yin, C.B.	Science of the Total Environment	2022	10.1016/j.scitotenv.2021.152555	2	We developed an integrated model to explain the scientific question of how smart-phone use influence farmers' behavior of adopting a conservation agricultural practice-rice-green manure rotation system.
1	Climate change adaptation (CCA) research in Nepal: implications for the advancement of adaptation planning	Karki, G.; Bhatta, B.; Devkota, N. R..; Acharya, R.P.; Kunwar, R.M.	Mitigation and Adaptation Strategies for global change	2022	10.1007/s11027-021-09991-0	4	The study focus was also discrete, and the perception and attitude and impact assessment of climate change were common agendas; however, the drivers of change and options for adaptation were understudied. CCA with multipronged initiatives provide a broader understanding of dynamics and governance of climate change that not only affects rural livelihoods, but also influences regional and global environments and biodiversity.
1	Challenges in Diagnosis of Crimean-Congo Hemorrhagic Fever A Case Report on Patient With Self-Referral	Almayahi, Z.K.; Al Kindi, H.; Al Jabri, I.; Al Shaqsi, N.; Al Hattali, N.; Al Hattali, A.; Al Quyoodhi, B.; Al Dhuhli, K.	Infectious Diseases in Clinical Practice	2022	10.1097/IPC.0000000000001108	4	About the Crimean-Congo hemorrhagic fever.

1	Local residents' policy preferences in an energy contested region - The Upper Hunter, Australia	Colvin, R.M.; Przybyszewski, E.	Energy Policy	2022	10.1016/j.enpol.2022.112776	6	The study explore local residents' priorities for policy processes in the Upper Hunter in New South Wales, Australia.
1	How do consumers perceive open-source seed licenses? Exploring a new credence attribute	Kliem, L.; Wolter, H.	International Journal of Consumer Studies	2022	10.1111/ijcs.12780	4	In this paper, we, hence, examine German consumers' perceptions of open-source seed licenses.
1	Utilization of fuelwood species by the Bhangalis community of western Himalaya, India	Sharma, A.; Uniyal, S.K.; Batish, D.R.; Singh, H.P.	Environment Development and Sustainability	2022	10.1007/s10668-022-02188-8	4	The present study was conducted among the Bhangalis, a resident community of Chhota Bhangal (Himachal Pradesh), to document their fuelwood use and knowledge variations with sociocultural factors.
1	Critical Thermal Maximum Values for Stream Fishes, Including Distinct Populations of Smallmouth Bass	Brewer, S.K.; Mollenhauer, R.; Alexander, J.; Moore, D.	North American Journal of Fisheries Management	2022	10.1002/nafm.10749	4	Our study objectives were to determine the thermal tolerances of 17 stream fishes (15 species and 2 genetically distinct populations of juvenile Smallmouth Bass Micropterus dolomieu: the Neosho subspecies M. dolomieu velox and the Ouachita strain M. sp. cf. dolomieu velox).
1	Shading in family coffee farms as an environmental incentive promoter for ecosystem services in Tolima, Colombia	Aguirre Cuellar, B.; Chica Lobo, J.; Moreno Elcure, F.	International Journal of Agricultural Sustainability	2022	10.1080/14735903.2022.2041234	4	This study assessed 30 farms through semi-structured interviews and an on-site evaluation to analyze the shade conditions in family farming coffee systems in the central region of Tolima, Colombia, with the purpose of promote environmental incentives and get better prices for the producer.
1	Exploring Climate Change Perspectives. An Analysis of Undergraduate Students' Place-Based Attachment in Appalachia, USA	Caretta, M.A.; Rothrock, B.A.; Zegre, N.P.	Rural Sociology	2022	10.1111/ruso.12433	3	Grounded in two quantitative survey iterations with approximately 446 responses, 28 semi-structured interviews, and 4 focus groups with 60 undergraduate students from six state universities in the Appalachian region, this five-year study explores the role of place-based attachment and emotions in framing undergraduate students' climate change perspectives.
1	How do farmers cope with climate change? An analysis of alternative adaptation strategies in drought-hit areas of Khyber Pakhtunkhwa-Pakistan	Khan, I.A.; Rafiq, M.; Panezai, S.; Saqib, S.E.; Ullah, R.; Atiq, M.	Natural Hazards	2022	10.1007/s11069-022-05264-4	4	This study has investigated farmers' preferences for climate change adaptation strategies as well as their socioeconomic determinants.
1	The effects of educator's level of environmental literacy on their issue identification practices	Hunter, R.H.; Jordan, R.C.	Environmental Education Research	2022	10.1080/13504622.2022.2045003	4	This study uses a contextual perspective on environmental literacy which includes such a continuum to examine the relationship between level of environmental literacy and patterns of environmental issue identification.
1	Local perception of ecosystem services and their conservation in Sudanian savannas of Burkina Faso (West Africa)	Nabaloum, A.; Goetze, D.; Ouedraogo, A.; Porembski, S.; Thiombiano, A.	Journal of Ethnobiology and Ethnomedicine	2022	10.1186/s13002-022-00508-w	4	This study aims to investigate knowledge of local populations on ecosystem services (ES) and perception of their conservation.
1	Island Stories: Mapping the (im)mobility trends of slow onset environmental processes in three island groups of the Philippines	Ayeb-Karlsson, S.; Uy, N.	Humanties & Social Sciences Communications	2022	10.1057/s41599-022-01068-w	4	There is an immediate lack of people-centred empirical evidence investigating how slow onset events influence human (im)mobility across the globe. In this study, 48 qualitative focus group discussions in the Philippines elaborated around people's (im)mobility pathways in the context of slow onset events.
1	Exploring farmers' adaptation strategies to water shortage under climate change in the Tunisian semi-arid region	Soltani, L.; Mellah, T.	Environmental Management	2022	10.1007/s00267-022-01604-z	4	This study explores the adaptation strategies to water shortage at the farm level in the Tunisian semi-arid region and investigates factors determining the farmers' behavior.
1	Can smartphone use increase farmers' willingness to participate in the centralized treatment of rural domestic sewage? Evidence from rural China	Tang, L.; Luo, X.F.; Huang, Y.Z.; Du, S.X.; Yan, A.Q.	Environmental Development and Sustainability	2022	10.1007/s10668-022-02176-y	4	Based on survey data of farmers in the Hubei and Henan provinces, this study uses the endogenous switching probit model to empirically test the impact of smartphone use on farmers' willingness to participate in the centralized treatment of rural domestic sewage (WTP-RDSCT).
1	'Adaptation science' is needed to inform the sustainable management of the world's oceans in the face of climate change	Hidalgo, M.; Bartolino, V.; Coll, M.; Hunsicker, M.E.; Travers-Trolet, M.; Browman, H.I.	Ices Journal of Marine Science	2022	10.1093/icesjms/fsac014	4	We summarize the contributions included in this TS that provide examples of emerging climate change impacts, assess system risks at subnational and international scales, prove and evaluate different adaptation options and approaches, and explore societal and stakeholder perceptions.
6	How do human actions affect fisheries? Differences in perceptions between fishers and scientists in the Maine lobster fishery	McClenachan, L.; Record, N.R.; Waller, J.	Facets	2022	10.1139/facets-2021-0030174	3	Here, we used surveys to construct mental models of the Maine lobster fishery, identifying divergent views held by two key stakeholder groups: lobster fishers and marine scientists. The two groups were differentiated by their perceptions of the relative impact of pollution, water temperature, and fishing.
1	Flood resilience in paired US-Mexico border cities: a study of binational risk perceptions	Freimund, C.A.; Garfin, G.M.; Norman, L.M.; Fisher, L.A.; Buizer, J.L.	Natural Hazards	2022	10.1007/s11069-022-05225-x	4	We explore binational community perceptions of flooding, preferences for watershed management, and potential actions to address flooding and increase socio-ecological resilience in Ambos Nogales using standardized questionnaires and interviews to collect data about people and their preferences.
1	Analyzing the role of meteorological parameters and CO2 emissions towards crop production: empirical evidence from South Asian countries	Ul-Haq, Z.; Mehmood, U.; Tariq, S.; Qayyum, F.; Azhar, A.; Nawaz, H.	Environmental Science and Pollution Research	2022	10.1007/s11356-022-18567-7	3	This work attempts to explore the climatic indicators on agricultural production for selected South Asian countries over the annual data of 1961-2016.
1	The wind that shakes the barley: the role of East Asian cuisines on barley grain size	Ritchey, M.M.; Sun, Y.F.; Matuzeviciute, G.M.; Shoda, S.; Pokharia, A.K.; Spate, M.; Tang, L.; Song, J.X.; Li, H.M.; Dong, G.H. Vaiglova, P.; Frachetti, M.; Liu, X.Y.	World Archaeology	2022	10.1080/00438243.2022.2030792	4	This paper investigates the eastern movements of barley grains and their morphological variations in prehistory.
1	Agro-Environmental Practices and Business Performance in the Wine Sector	Ignjatijevic, S.; Tankosic, J.V.; Lekic, N.; Petrovic, D.; Brkanlic, S.; Vapa, B.; Tomasevic, V.; Puvaca, N.; Prodanovic, R.; Milojevic, I.	Agriculture-Basel	2022	10.3390/agriculture12020239	3	The objective of this research was to investigate attitudes of winery owners/managers on business performance of the wineries concerning the environmental behavior and its disclosure.
1	How Farmers Conceive and Cope with Megatrends: The Case of Finnish Dairy Farmers	Lahnamaki-Kivela, S.; Kuhmonen, T.	Sustainability	2022	10.3390/su14042265	4	The study explores the association between eight common megatrends and business strategies among a sample of Finnish dairy producers.

1	Sustainable Entrepreneurship for Business Opportunity Recognition: Analysis of an Awareness Questionnaire among Organisations	Fidlerova, H.; Starecek, A.; Vranakova, N.; Bulut, C.; Keaney, M.	Energies	2022	10.3390/en15030849	4	The main aim of the article is to identify the awareness level of sustainability and sustainable development goals in the context of business opportunity areas by analysing the results of a survey of organisations in six countries (Finland, Slovakia, Italy, Austria, Spain, and Turkey).
1	Leveraging Multi-Source Data and Digital Technology to Support the Monitoring of Localized Water Changes in the Mekong Region	Polpanich, O.U.; Bhatpuria, D.; Santos, T.F.S.; Krittasudthacheewa, C.	Sustainability	2022	10.3390/su14031739	4	This paper introduces the availability of the high-resolution Water Monitoring System (WMS) developed from a mix of sophisticated multi-spectral satellite imageries, analytic and data sciences, and cloud computing, for monitoring the changes in water levels and vegetation water stress at the local scale.
1	Assessing the State of ICZM in an Island Tourist Destination-Applying SESs and Ostrom's Collective Action Principles: A View from Coastal Communities	Arefipour, T.; Alipour, H.; Safaeimanesh, F.	Sustainability	2022	10.3390/su14031066	4	This paper aims to investigate the state of integrated coastal zone management (ICZM), which is justified as a strategy for managing coastal resources with respect to increasing pressures from tourism, farming, climate change, urbanization, population growth, etc.
1	Diversity and patterns of marine non-native species in the archipelagos of Macaronesia	Castro, N.; Carlton, J.T.; Costa, A. C.; Marques, C.S.; Hewitt, C.L.; Cacabelos, E.; Lopes, E.; Gizzi, F.; Gestoso, I.; Monteiro, J.G.; Costa, J.L.; Parente, M.; Ramalhosa, P.; Fofonoff, P.; Chainho, P.; Haroun, R.; Santos, R.S.; Herrera, R.; Marques, T.; Ruiz, G.M.; Canning-Clode, J.	Diversity and Distributions	2022	10.1111/ddi.13465	4	The present study is the first attempt to grasp the scale and richness of marine biological invasions in Macaronesia. We pioneered a comprehensive non-native species (NNS), inventory in the region to determine their diversity patterns and native distribution origins.
1	Farming Households' Satisfaction With Quality of Agricultural Extension Services: A Case Study of Quang Binh Province, Vietnam	Truong, D.D.	Frontiers in Sustainable Food Systems	2022	10.3389/fsufs.2021.779477	4	This study assesses the satisfaction of farmers with AE services in Quang Binh province, Vietnam.
1	Internal family systems as an eco-spirituality model: Hearing the cries, confrontation, and call from Covid-19	Baldwin, J.L.	Dialog-A Journal of Theology	2022	10.1111/dial.12715	4	This article explores the potential of Internal Family Systems as a spiritual practice that can guide human responses to restoring right relationship as species on the planet. It problematizes the centralizing of the coronavirus in human experiences and argues for an awareness of the pandemic within the larger context of climate change.
1	Credit access and perceived climate change resilience of smallholder farmers in semi-arid northern Ghana	Batung, E.S.; Mohammed, K.; Kansanga, M.M.; Nyantakyi-Frimpong, H.; Luginaah, I.	Environmental Development and Sustainability	2022	10.1007/s10668-021-02056-x	4	Using an ordered logistic regression model, this study analyzed data from a cross-sectional survey (n = 1,100) in the Upper West Region to examine the relationship between smallholder farmers' access to credit and their perceived climate change resilience.
1	Perspective Roadmap to develop a stress test for forest ecosystem services supply	Kramer, K.; Bouriaud, L.; Feindt, Peter H.; van Wassenaer, L .; Glanemann, N.; Hanewinkel, M.; van der Heide, M.; Hengeveld, G.M.; Hoogstra, M.; Ingram, V.; Levermann, A.; Lindner, M.; Matyas, C.; Mohren, F.; Muys, B.; Nabuurs, G.J.; Palahi, M.; Polman, N.; Reyer, C.P.O.; Schulze, E.D.; Seidl, R.; de Vries, W.; Werners, S. E.; Winkel, G.; Yousefpour, R.	One Earth	2022	10.1016/j.oneear.2021.12.009	4	The forests experience massive increases in stresses in their ecological and socioeconomic environments, threatening forest ecosystem services supply. Identifying which stresses threaten forest ecosystem services supply and which factors hamper their alleviation requires stakeholders' perceptions.
1	Perception and adaptation to higher temperatures among poultry farmers in Nigeria	Sanou, A.; Kerr, J.M.; Hodbod, J.; Liverpool-Tasie, L.S.O.	Environmental Development and Sustainability	2022	10.1007/s10668-021-02017-4	3	This study focuses on the effects of higher temperatures on commercial poultry farms in southwest Nigeria and their adaptation strategies.
1	An assessment of USDA corn condition ratings across the US Corn Belt	Bundy, L.R.; Gensini, V.A.	Agronomy Journal	2022	10.1002/agj2.20973	2	This study aims to quantify the correlation of corn condition ratings with climate variables and yield, understand intergrowing season behavior of corn condition ratings, and quantify spatiotemporal trends of ratings across the U.S. Midwest (1986-2020).
1	Tracking the effect of climatic and non-climatic elements on rice production in Pakistan using the ARDL approach	Gul, A.; Wu, X.M.; Chandio, A. A.; Rehman, A.; Siyal, S.A.; Asare, I.	Environmental Science and Pollution Research	2022	10.1007/s11356-022-18541-3	2	The present study aims to investigate the effect of climatic and non-climatic factors on rice production by employing an annual time series data from the period of 1970 to 2018.
1	Behavioral adaptation to climate change: new insights on psychosocial frameworks from the context of managed forests	Fischer, A.P.; Russo, M.; Powers, G.	Sustainability Science	2022	10.1007/s11625-021-01085-9	3	Through focus group interviews and qualitative data analysis, we investigated influences on behavioral adaptation to climate change among owners of small woodlands in the Upper Midwest, USA.
1	Small Forest Owners' Response to Wildfire Risk Within a Management-Logic Framework	Novais, A.; Canadas, M.J.	Small-Scale Forestry	2022	10.1007/s11842-021-09499-0	3	Understanding forest owners' responses to wildfire-risk is therefore essential to trigger action in this regard. Acknowledging recent developments in research, we develop and apply an innovative conceptual framework focused on the socioeconomic logics in forest management, in order to explain family forest owners' response to wildfire-risk.
1	Fiscal decentralization and economic growth revisited: an empirical analysis of poverty governance	Song, J.X.; Geng, L.L.; Fahad, S.; Liu, L.C.	Environmental Science and Pollution Research	2022	10.1007/s11356-021-18470-7	4	Based on the panel data of 24 provinces from 2010 to 2018, the static panel model was utilized to analyze the impact of fiscal decentralization and economic growth on poverty reduction, and the Moran index was used to calculate the spatial agglomeration effect of poverty degree.
1	Agro-climate services and drought risk management in Jamaica: A case study of farming communities in Clarendon Parish	Buckland, S.; Campbell, D.	Singapore Journal of Tropical Geography	2022	10.1111/sjtg.12414	4	Climate Information Services (CIS) have been promoted as an agile risk management strategy to help farmers negotiate challenges of increased climate extremes. Yet, despite the promise and possibilities of CIS, there is limited evidence of CIS uptake and associated risk reduction across the Caribbean. A mixed-method research approach is used to examine the uptake of CIS among farmers (N = 356), testing the association with selected drought impact outcomes in one of Jamaica's breadbasket regions.
1	Social Vulnerability to Irrigation Water Loss: Assessing the Effects of Water Policy Change on Farmers in Idaho, USA	Hawes, J.K.; Burnham, M.; du Bray, M. V.; Hillis, V.; Ma, Z.; Running, K.	Environmental Management	2022	10.1007/s00267-021-01586-4	2	Location: Eastern Snake Plain of Idaho.

1	The Art of Letting Go: Transforming Participatory Research on Adaptation Practices Among Local Livestock-Keepers in East Africa in Times of Covid-19	Habermann, B.; Crane, T.A.; Gichuki, L.; Worku, T.; Mugumya, R.; Maiyo, N.; Kiptoo, E.; Goshme, S.; Mohammednur, F.; Tugume, G.; Satia, K.A.; Siamito, J.R.	Frontiers in Sustainable Food Systems 5	2022	10.3389/fsufs.2021.768445	4	To better understand how Covid-19 changed the way PAR is applied, we analyzed PAR in agricultural research for development carried out in the Programme for Climate-Smart Livestock Systems (PCSL) implemented by the International Livestock Research Institute (ILRI) at five research sites in Kenya, Ethiopia, and Uganda.
1	Factors Influencing Farmers' Awareness and Risk Perception of Environmental Degradation in Bangladesh	Rahman, A.; Zhu, N.P.; Il Islam, M.D.; Anny, S.A.; Afroj, M.; Sarker, M.N.I.; Islam, M.W.	Polish Journal of Environmental Studies	2022	10.15244/pjoes/141344	3	Does not mention smallholders.This study intends to analyze rice farmers' level of awareness and perception of the impacts of environmental degradation, and factors influencing the awareness. Primary data were collected from 300 rice producers in six districts in Bangladesh during August-September 2019 by a structured questionnaire, where agricultural arable lands have been degraded the most.
1	Flash flood-induced vulnerability and need assessment of wetlands using remote sensing, GIS, and econometric models	Islam, M.M.; Ujiie, K.; Noguchi, R.; Ahamed, T.	Remote Sensing Applications-Society and Environment	2022	10.1016/j.rsase.2021.100692	4	In line with the contention, an effort has been made to restrict flash flood vulnerability mapping and need assessment based on vulnerability classification at haor regions in Bangladesh using satellite remote sensing, geographic information system (GIS), and econometric models.
1	Farmers' perceptions and spatial statistical modeling of most systematic LULC transitions: Drivers and livelihood implications in Awash Basin, Ethiopia	Damtew, A; Teferi, E; Ongoma, V	Remote Sensing Applications-Society and Environment	2022	10.1016/j.rsase.2021.100661	4	This study was conducted to quantify the major LULC transition and its drivers through the combination of a spatial statistical model with surveying the local understanding of possible drivers of LULC changes driving forces in the Awash-Awash River Sub Basin.
1	The Evaluation of Temporal and Spatial Trends of Global Warming and Extreme Ocean Surface Temperatures: A Case Study of Canada	Wang, Y.M.; Sarkar, A.; Hasan, A.K.; Tian, Y.D.; Wu, Q.; Hossain, M.S.; Wei, F.	ISPRS International Journal of Geo-Information	2022	10.3390/ijgi11010021	4	The study takes Canada as an example, and selects six representative provinces to evaluate the temporal change characteristics of extreme temperature at different sites. We use MATLAB software to perform multiple linear regression, linear fitting methods, and Pearson correlation analysis to analyze spatial changes and time-space trends. The method studies the relationship between the emergence of extreme weather and climate change and uses the evolutionary game theory to explore whether there is any contradiction between global warming and extreme local cold.
1	The Impacts of Urbanization to Improve Agriculture Water Use Efficiency-An Empirical Analysis Based on Spatial Perspective of Panel Data of 30 Provinces of China	Lu, W.A.; Sarkar, A.; Hou, M.Y.; Liu, W.X.; Guo, X.Y.; Zhao, K.; Zhao, M.J.	Land	2022	10.3390/land11010080	4	Based on the panel data of 30 provinces in China from 1999 to 2018, the article uses the Super-SBM model to measure the AWUE. Moreover, the study uses the entropy method to establish the urbanization evaluation index system from the dimensions of population, land, economy, measures the comprehensive level of urbanization development, and further constructs a dynamic spatial econometric model.
1	Understanding zero deforestation and the High Carbon Stock Approach in a highly forested tropical country	Lyons-White, J.; Yobo, C.M.; Ewers, R.M.; Knight, A.T.	Land Use Policy	2022	10.1016/j.lusepol.2021.105770	4	We investigated perspectives of stakeholders in Gabon about zero deforestation and the HCSA using Critical Systems Heuristics, a systems thinking methodology. In 25 interviews with government, NGOs, companies, and research institutions, and two focus groups with rural communities, we identified three contrasting perspectives on forest conservation and agro-industrial development: international, national, and local.
1	Viewpoint: The case for a six-dimensional food security framework	Clapp, J.; Moseley, W.G.; Burlingame, B.; Termine, P.	Food Policy	2022	10.1016/j.foodpol.2021.102164	4	In this article, we make the case that it is time for a formal update to our definition of food security to include two additional dimensions proposed by the High Level Panel of Experts on Food Security and Nutrition: agency and sustainability.
1	Determinants in the Adoption of Alternate Wetting and Drying Technique for Rice Production in a Gravity Surface Irrigation System in the Philippines	Samoy-Pascual, K.; Yadav, S.; Evangelista, G.; Burac, M.A.; Rafael, M.; Cabangon, R.; Tokida, T.; Mizoguchi, M.; Regalado, M.J.	Water	2022	10.3390/w14010005	4	This study empirically explored factors shaping Alternate Wetting and Drying adoption in a gravity surface irrigation system.
1	Farmers' perception of climate change and adaptation strategies: a study of the Lower Gangetic Plain in India	Kundu, S.K.; Mondal, T.K.	Arabian Journal of Geosciences 1	2022	10.1007/s12517-021-09390-4	3	Does not mention smallholders. In this study, an attempt has been made to assess the farmers' perception of climate change over the last 30 years (1986 to 2015) and adaptation strategies in agriculture along with their determinants in Lower Gangetic Plain, India. A total of 528 households from nine villages have been surveyed in Maldah district located in the Lower Gangetic Plain of India.
6	Envisioning sustainable carbon sequestration in Swedish farmland	Johansson, E.L.; Brogaard, S.; Brodin, L.	Environmental Science and Policy	2022	10.1016/j.envsci.2022.04.005	4	The overall aim of this research is to imagine Swedish farms as carbon sinks rather than sources, and how to re-design the current farm- and food system to also address other social, economic, and environmental sustainability challenges.
2	Assessment of eutrophication potential from fertiliser application in agricultural systems in Thailand	Balasuriya, B.T.G.; Ghose, A.; Gheewala, S.H.; Prapaspongsa, T.	Science of the Total Environment	2022	10.1016/j.scitotenv.2022.154993	4	This study assessed the marine and freshwater eutrophication potentials associated with the fertiliser application in rice, maize, cassava, sugar cane and oil palm, cultivation in Thailand using a life cycle assessment characterisation model at midpoint and endpoint levels.
2	Quantifying current and future raw milk losses due to bovine mastitis on European dairy farms under climate change scenarios	Guzmán-Luna, P.; Nag, R.; Martínez, I.; Mauricio-Iglesias, M.; Hospido, A.; Cummins, E.	Science of the Total Environment	2022	10.1016/j.scitotenv.2022.155149	4	This research aimed to predict the raw milk losses in three major dairy-producing regions across Europe (i.e. Mediterranean, Atlantic and Continental) under climate change scenarios.
2	The structure of the mangrove forests of Kiunga-Pate Island conservancies in Kenya are shaped by selective harvesting and natural mortalities	Okello, J.A.; Osuka, K.E.; Maina, G.W.; Mbugua, J.; Samoilys, M.A.	Estuarine, Coastal and Shelf Science	2022	10.1016/j.ecss.2022.107885	4	Here, the structural status of the mangroves around Pate Island and Kiunga Marine National Reserve (KMNR) was assessed and information applied to guide and promote community-based conservation, as well as the development of the national mangrove management plan.
2	Climate change and Indian agriculture: A systematic review of farmers' perception, adaptation, and transformation	Datta, P.; Behera, B.; Rahut, D.B.	Environmental Challenges	2022	10.1016/j.envc.2022.100543	8	The present study systematically reviews the literature on farmers' perception and adaptation in India, drawing mainly from Scopus and Web of Science.
2	Water pollution in India – Current scenario	Jadeja, N.B.; Banerji, T.; Kapley, A.; Kumar, R.	Water Security	2022	10.1016/j.wasec.2022.100119	4	Key considerations in wastewater treatment, groundwater management, existing knowledge gaps, and policies for water management in India are discussed.
2	Cover crops and carbon stocks: How under-vine management influences SOC inputs and turnover in two vineyards	Marks, J.N.J.; Lines, T.E.P.; Penfold, C.; Cavagnaro, T.R.	Science of the Total Environment	2022	10.1016/j.scitotenv.2022.154800	4	This research aims to quantify SOC stocks and dissolved organic carbon (DOC) in soils from four treatments of under-vine management practice including two cover crop combinations, a straw mulch and herbicide-managed control across two vineyard sites established in 2014.
2	Crop residue burning in South Asia: A review of the scale, effect, and solutions with a focus on reducing reactive nitrogen losses	Lin, M.; Begho, T.	Journal of Environmental Management	2022	10.1016/j.jenvman.2022.115104	8	This paper reviews the literature on crop residue burning - a widespread practice in many regions in South Asia.
6	Spatial distribution maps of real-time ocean observation platforms and sensors in Japanese waters	Tanaka, K.; Zhu, M.; Miyaji, K.; Kurokawa, T.; Akamatsu, T.	Marine Policy	2022	10.1016/j.marpol.2022.105102	4	In this study, the existing observation platforms and installed sensors, particularly fixed platforms that enable real-time data transmission, were reviewed, and the spatial distribution of them was investigated. It was confirmed that a large number of observation networks cover Japanese waters; however, many of those platforms were used for single purpose, and the spatial coverage was still considerably limited for some sensors, such as salinity, dissolved oxygen, and chlorophyll a.
6	Inventory of agroecosystem services and perceptions potential implications due to climate change: A case study from Benin in West Africa	Belfrid, D.M.; Arcadius, D.; N'tcha Yekanbessoun, M.; Mariano, S.; Fidèle, S.; Jean, A.; Pepin, A.M.	Environmental Impact Assessment Review	2022	10.1016/j.eiar.2022.106792	3	No mention small-scale populations. The survey took into account various categories of stakeholders, namely food crop producers, cotton growers, local and religious authorities and agricultural extension agents.

6	Combining stakeholder perception and ecological approaches for assessing vulnerability of floodplain wetlands in changing climate: a regional study	Sarkar, U.K.; Karnatak, G.; Lianthuamluaia, L.; Puthiyottil, M.; Das Ghosh, B.; Johnson, C.; Kumari, S.; Saha, S.; Das, B.K.	International Journal of Biometeorology	2022	10.1007/s00484-022-02286-2	3	In the present study, vulnerability assessment was carried out in nine floodplain wetlands from three districts of West Bengal using stakeholder perception and ecological conditions.
6	What is the importance of climate research? An innovative web-based approach to assess the influence and reach of climate research programs	Carneiro, B.; Resce, G.; Läderach, P.; Schapendonk, F.; Pacillo, G.	Environmental Science and Policy	2022	10.1016/j.envsci.2022.03.018	4	This study employs the Digital Methods epistemology to explore the dynamics of agriculture-focused climate science and changes in attitude towards Climate Smart Agriculture (CSA) and climate change, using the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) as a case study.
6	Plenty more fish in the sea? – is there a place for seafood within a healthier and more sustainable diet?	Steenson, S.; Creedon, A.	Nutrition Bulletin	2022	10.1111/nbu.12553	4	In this article, we provide professionals working in diet, nutrition and health with an insight into the challenges facing the seafood sector and offer advice on how consumers may include seafood within a healthier and more sustainable diet.
6	Local and tourist perceptions of coastal marine habitats in Cap de Creus (NE Spain)	Mallo, M.; Ziveri, P.; Rossi, S.; Reyes-García, V.	Regional Environmental Change	2022	10.1007/s10113-022-01924-0	3	We studied perception of ecosystem services, impacts and threats of CMHs by locals and tourists (n = 624) of Cap de Creus MPA (NW Mediterranean Sea).
12	Stakeholders Perceptions of Non-indigenous Freshwater Fish Species: A Case Study from a Mediterranean Biodiversity Hotspot	Vardakas, L.; Perdikaris, C.; Zogaris, S.; Kalantzi, O.-I.; Koutsikos, N.	Environmental Management	2022	10.1007/s00267-022-01623-w	3	This study aimed to assess the perceptions associated with non-indigenous freshwater fish species (NIFS) among environmental-related professional and non-professional stakeholders in a Mediterranean country that displays high levels of fish species endemism, by using a questionnaire survey approach.
6	Modeling Canadian farmer's intention to adopt eco-friendly agricultural inputs and practices	Araujo, F.S.M.; Fantucci, H.; de Oliveira Lima, S.H.; de Abreu, M.C.S.; Santos, R.M.	Regional Environmental Change	2022	10.1007/s10113-022-01901-7	3	This article reports the results of a survey with Canadian farmers (n = 166) to analyze the mechanisms that shape their intention to adopt farming practices that can mitigate climate change. Specifically, we are interested in assessing the farmers' fertilizer purchase behavior in the face of climate change challenges.
2	Internet of Things (IOT) Approach to combating economic and environmental issues	Ebiesuwa, S.; Blaise, O.O.; Adio, A.; Kanu, R.U.; Aderonke, A.	Journal of Theoretical and Applied Information Technology	2022		4	This paper aims at providing an insight into Internet of Things (IoT) and its applications in combating global warming, by conducting a literature review to highlight various ways via which IoT is being applied, and discussing the various benefits, whether economical or environmental, that comes with adopting IoT; as well as challenges hindering IoT adoption.
10	Effects of perceptions on adoption of climate-smart agriculture innovations: empirical evidence from the upper Blue Nile Highlands of Ethiopia	Meshesha, A.T.; Birhanu, B.S.; Bezabih Ayele, M.	International Journal of Climate Change Strategies and Management	2022	10.1108/IJCCSM-04-2021-0035	4	This study aims to examine smallholder farmers' perceptions toward the adoption of climate-smart agriculture (CSA) in smallholder farmers in the Upper Blue Nile Highlands of Ethiopia.
6	Determining Farmers' Awareness About Climate Change Mitigation and Wastewater Irrigation: A Pathway Toward Green and Sustainable Development	Sohail, M.T.; Elkaeed, E.B.; Irfan, M.; Acevedo-Duque, Á.; Mustafa, S.	Frontiers in Environmental Science	2022	10.3389/fenvs.2022.900193	3	The present study was conducted in one of the major agriculture areas to check farmers' awareness of climate change, adaptation measurements, and use of wastewater for irrigation.
2	Invasive Alien Plant Species—Raising Awareness of a Threat to Biodiversity and Ecological Connectivity (EC) in the Adriatic-Ionian Region	Gazoulis, I.; Antonopoulos, N.; Kanatas, P.; Karavas, N.; Bertoncelj, I.; Travlos, I.	Diversity	2022	10.3390/d14050387	4	The present study focused on perennial herbaceous species whose occurrence in the Adriatic-Ionian region has increased in the last two decades, namely common milkweed (Asclepias syriaca), Jerusalem artichoke (Helianthus tuberosus), Japanese knotweed (Reynoutria japonica), Bohemian knotweed (Reynoutria × bohemica), giant hogweed (Heracleum mantegazzianum), giant goldenrod (Solidago gigantea), Canadian goldenrod (Solidago canadensis), and Bermuda buttercup (Oxalis pes-caprae).
6	Multifunction Land Use to Promote Energy Communities in Mediterranean Region: Cases of Egypt and Italy	Abouaiana, A.; Battisti, A.	Land	2022	10.3390/land11050673	4	This paper promotes the energy community and agrivoltaic key concepts as pillars to show how buildings and farms' land uses positively impact the ecosystem. The study focused on Egypt and Italy as representatives of the entire region.
6	Dynamics of Environmental Conservation Agriculture (ECA) Utilization among Fujioka Farmers in Japan with High Biodiversity Conservation Awareness but Low ECA Interest	Maharjan, K.L.; Gonzalvo, C.; Aala, W. Jr.	Sustainability (Switzerland)	2022	10.3390/su14095296	4	To address this problem and to know what factors influence ECA adoption, we collected data from Fujioka city, Gunma prefecture, which has low ECA utilization but has high biodiversity conservation efforts.
2	Cowpea (Vigna unguiculata L. Walp.): A choice crop for sustainability during the climate change periods	Ayalew, T.; Yoseph, T.	Journal of Applied Biology and Biotechnology	2022	10.7324/JABB.2022.100320	8	This review aimed to assess the agro-symbiotic performance, utilization, and climate change response capacity of the crop to exploit its potential toward sustainability.
6	Comparing public expectations with local planning efforts to mitigate coastal hazards: A case study in the city of New Orleans, USA	Cass, E.; Shao, W.; Smiley, K.	International Journal of Disaster Risk Reduction	2022	10.1016/j.ijdrr.2022.102940	6	The propose a comprehensive framework to study urban disaster resilience under climate change with New Orleans of Louisiana in the U.S. as the study area.
6	Nuanced assessment of livelihood resilience through the intersectional lens of gender and ethnicity: Evidence from small-scale farming communities in the upland regions of Vietnam	Tran, V.T.; An-Vo, D.-A.; Mushtaq, S.; Cockfield, G.	Journal of Rural Studies	2022	10.1016/j.jrurstud.2022.03.011	4	Based on empirical evidence from ethnic minorities in the Northwest Mountainous Regions (NMRs) of Vietnam, the current work illustrates how perceptions of livelihood resilience in the context of climate change differ between gender and ethnic groups, especially considering the intersections of those factors. To achieve a nuanced analysis, we examined if and how demographic factors differentially associate with the perception of household livelihood resilience.
6	Geographies of climate change opinion	Tuitjer, L.; Dirksmeier, P.; Mewes, L.	Geography Compass	2022	10.1111/gec3.12619	8	This review synthesises these findings and highlights the different geographies (the self, the nation, the region, the digital) that emerge within this research.
6	Perceptions of access and benefits from community-based aquaculture through Photovoice: A case study within a locally managed marine area in Madagascar	Funk, L.; Wilson, A.M.W.; Gough, C.; Brayne, K.; Djerryh, N.R.	Ocean and Coastal Management	2022	10.1016/j.ocecoaman.2022.106046	4	This study focused on understanding community perceptions of both access to, and benefits from, two CBA projects within the Velondriake LMMA involving seaweed and sea cucumber aquaculture.
6	Assessing local perceptions of deforestation, forest restoration, and the role of agroecology for agroecosystem restoration in northern Malawi	Kpienbaareh, D.; Luginaah, I.; Bezner Kerr, R.; Wang, J.; Poveda, K.; Steffan-Dewenter, I.; Lupafya, E.; Dakishoni, L.	Land	2022	10.1002/ldr.4238	4	Here, we explore the drivers of deforestation, the perceptions of restoration, and the challenges to restoration among smallholder farmers in northern Malawi and examine how agroecology can contribute to restoring degraded agroecosystems.

10	Role of Wild Food Environments for Cultural Identity, Food Security, and Dietary Quality in a Rural American State	Ahmed, S.; Warne, T.; Stewart, A.; Byker Shanks, C.; Dupuis, V.	Frontiers in Sustainable Food Systems	2022	10.3389/fsufs.2022.774701	4	This case study examines practices, experiences, and perceptions associated with wild food environments through a household survey in the rural American state of Montana.
6	Transdisciplinary, Co-Designed and Adaptive Management for the Sustainable Development of Rongcheng, a Coastal City in China in the Context of Human Activities and Climate Change	Tu, C.; Ma, H.; Li, Y.; Fu, C.; You, Z.-J.; Newton, A.; Luo, Y.	Frontiers in Environmental Science	2022	10.3389/fenvs.2022.670397	4	In this transdisciplinary study, a social-ecological analysis based on a combination of the Systems Approach Framework and the Drivers-Pressures-States-Impacts-Responses framework was used to analyze and formulate an adaptive management plan for the sustainability of Rongcheng. More than 40 stakeholders including government, companies, civil society and institutions participated in the study through questionnaires and on-site meetings.
10	Education, financial aid, and awareness can reduce smallholder farmers' vulnerability to drought under climate change	Wens, M.L.K.; Van Loon, A.F.; Veldkamp, T.I.E.; Aerts, J.C.J.H.	Natural Hazards and Earth System Sciences	2022	10.5194/nhess-22-1201-2022	4	We applied ADOPT to assess the effect of four top-down disaster risk reduction interventions on smallholder farmers' drought risk in the Kenyan drylands: the robustness of additional extension services, lowered credit rates, ex ante rather than ex post cash transfers, and improved early warnings were evaluated under different climate change scenarios.
6	Valuing environmentally sustainable agriculture? Food and water concerns, production literacy, and consumption behaviours in rural-regional Australia	Ragusa, A.T.; Crampton, A.	Future of Food: Journal on Food, Agriculture and Society	2022	10.17170/kobra-202110144908	4	This article presents primary data exploring the salience of food and water concerns, compared with related knowledge, affecting agricultural product consumption. Online survey respondents (employees at a large organisation that states its values creating environmentally sustainable rural-regional communities while educating health, science, and agricultural professionals) demonstrated low pro-environmental sustainability literacy and behaviour regarding food and water consumption choices, despite having sustainability concerns and high level of education, including formal environmental science
2	Farming Households' Perception on Natural Disaster Impacts to Livelihoods and Adaptation Practices: A Case Study of Coastal Provinces in Central Vietnam	Mai, N.T.; Truong, D.D.	International Journal of Sustainable Development and Planning	2022	10.18280/ijsdp.170223	4	This study was conducted in 4 coastal provinces in Central Vietnam to evaluate farmers' perception of natural disaster impacts on livelihoods and their adaptation practices.
6	Risk communication and capacity-building: A case study on framing CBA strategies of artisanal fishing communities to sea-level rise using BASIEC	Khan, A.S.; Kumar, M.S.; Chella, R.S.	Climate Services	2022	10.1016/j.cliser.2022.100299	4	This study attempted to address the risk of rising sea levels and building capacity of artisanal fishing communities of Ennore region in Chennai situated on the east coast of India, as a case study. The study has addressed the following research questions: What sea-level rise risk information is required? How should it be communicated effectively? and how efficiently climate services can be utilized to enhance the capacities of communities to rising sea levels?
11	Factors influencing farmers adoption of climate smart agriculture to respond climate variability in Siyadebrina Wayu District, Central highland of Ethiopia	Kifle, T.; Ayal, D.Y.; Mulugeta, M.	Climate Services	2022	10.1016/j.cliser.2022.100290	4	This study examines determinants of CSA practices and status adoptions in Siyadebrina Wayu Distract.
2	Awareness of Green Technologies among Dairy MSMEs in Cagayan Valley an Administrative Region in the Philippines	Alvarez Ma,T.S.; Cañete, D.C.	Universal Journal of Agricultural Research	2022	10.13189/ujar.2022.100207	3	This study was conducted in Cagayan Valley covering Isabela, Quirino, Nueva Vizcaya, and Cagayan provinces from 2018 to 2020 with the Dairy Micro Small Medium Enterprises operating in the region as respondents and was selected from the list provided by the Department of Trade and Industry and the Department of Agriculture through the National Dairy Authority.
6	Educational Gardens and Climate Change Education: An Analysis of Spanish Preservice Teachers' Perceptions	Corrochano, D.; Ferrari, E.; López-Luengo, M.A.; Ortega-Quevedo, V.	Education Sciences	2022	10.3390/educsci12040275	3	Using an online questionnaire, this study examines the influence of the main sociodemographic and academic factors, and the role of connectedness to nature, on the perception of educational gardens as contexts of climate change education (CCE) among Spanish preservice teachers (PSTs).
6	Knowledge Priorities on Climate Change and Water in the Upper Indus Basin: A Horizon Scanning Exercise to Identify the Top 100 Research Questions in Social and Natural Sciences	Orr, A.; Ahmad, B.; Alam, U.; Appadurai, A.; Bharucha, Z.P.; Biemans, H.; Bolch, T.; Chaulagain, N.P.; Dhaubanjar, S.; Dimri, A.P.; Dixon, H.; Fowler, H.J.; Gioli, G.; Halvorson, S.J.; Hussain, A.; Jeelani, G.; Kamal, S.; Khalid, I.S.; Liu, S.; Lutz, A.; Mehra, M.K.; Miles, E.; Momblanch, A.; Muccione, V.; Mukherji, A.; Mustafa, D.; Najmuddin, O.; Nasimi, M.N.; Nüsser, M.; Pandey, V.P.; Parveen, S.; Pellicciotti, F.; Pollino, C.; Potter, E.; Qazizada, M.R.; Ray, S.; Romshoo, S.; Sarkar, S.K.; Sawas, A.; Sen, S.; Shah, A.; Shah, M.A.A.; Shea, J.M.; Sheikh, A.T.; Shrestha, A.B.; Tayal, S.; Tigala, S.; Virk, Z.T.; Wester, P.; Wescoat, J.L.; Jr.	Earth's Future	2022	10.1029/2021EF002619	4	Here we use a horizon scanning technique to identify the Top 100 questions related to the most pressing knowledge gaps and research priorities in social and natural sciences on climate change and water in the UIB. These questions are on the margins of current thinking and investigation and are clustered into 14 themes, covering three overarching topics of "governance, policy, and sustainable solutions", "socioeconomic processes and livelihoods", and "integrated Earth System processes".
2	The Impact of Climate Change and Soil Classification on Benzene Concentration in Groundwater Due to Surface Spills of Hydraulic Fracturing Fluids	Almaliki, A.J.D.; Bashir, M.J.K.; Borrajo, J.F.L.	Water (Switzerland)	2022	10.3390/w14081202	4	This study focused on investigating the impact of soil variability and water table depth on groundwater contamination.
6	Using TanDEM-X Global DEM to Map Coastal Flooding Exposure under Sea-Level Rise: Application to Guinea-Bissau	Fandé, M.B.; Lira, C.P.; Penha-Lopes, G.	ISPRS International Journal of Geo-Information	2022	10.3390/ijgi11040225	4	The study analyzes and discusses the application of a the simple "bathtub" model coupled with a high-precision global digital elevation models (TanDEM-X DEM) to areas where no other data are available.
6	Multilevel predictors of climate change beliefs in Africa	González, J.B.; Sánchez, A.	PLoS ONE	2022	10.1371/journal.pone.0266387	3	Using random forest methodology, we analyze survey and climate data from second-order political boundaries to explore what predicts climate change beliefs in Africa.
6	Does the Adoption of Climate-Smart Agricultural Practices Impact Farmers' Income? Evidence from Ghana	Agbenyo, W.; Jiang, Y.; Jia, X.; Wang, J.; Ntim-Amo, G.; Dunya, R.; Siaw, A.; Asare, I.; Twumasi, M.A.	International Journal of Environmental Research and Public Health	2022	10.3390/ijerph19073804	4	The purpose of this study is to ascertain whether CSA practices impact farmers' income.

6	Drought risk assessment of farmers considering their planting behaviors and awareness: A case study of a County from China	Guo, H.; Wen, X.; Wu, Y.; Wang, J.; Liang, Q.	Ecological Indicators	2022	10.1016/j.ecolind.2022.108728	4	The aim was to assess the vulnerability of farmers to drought and build a risk assessment framework.
2	Costs, Benefits and Obstacles to the Adoption and Retention of Shelterbelts: Regional Perception and Mind Map Analyses for Ukraine	Popov, A.; Tymoshevskyi, V.; Poliakh, V.	Geomatics and Environmental Engineering	2022	10.7494/geom.2022.16.2.157	4	The specific objective of this research was to identify the public costs, benefits and obstacles from the adoption and retention of shelterbelts.
2	Skippers' preferred adaptation and transformation responses to catch declines in a large-scale tuna fishery	Rubio, I.; Hobday, A.J.; Ojea, E.	ICES Journal of Marine Science	2022	10.1093/icesjms/fsab065	4	We seek to understand such individual adaptation in large-scale fisheries, using the case of the Spanish tropical tuna fishery.
6	Recreational fishers' perceptions of climate change	Ryan, K.L.; Shaw, J.; Tracey, S.R.; Lyle, J.M.	ICES Journal of Marine Science	2022	10.1093/icesjms/fsab194	3	Marine recreational fishing occurs in most countries with many participants interacting regularly with the environment, yet there have been few studies on the views of recreational fishers towards climate change. This study aims to assess perceptions of climate change for a boat-based recreational fishery in Western Australia, where fishing occurs across a wide latitudinal range, from tropical to temperate waters.
6	A Multicriteria Decision-Making Approach of "Tree" Meaning in the New Urban Context	Sturiale, L.; Scuderi, A.; Timpanaro, G.	Sustainability (Switzerland)	2022	10.3390/su14052902	4	The objectives of the study are to find out about the perception of urban green spaces and examine what kind of relationship should be established between the local authority and the population with regard to information and participation in the planning of green areas.
6	An experiential model of drought risk and future irrigation behaviors among central Minnesota farmers	Davenport, M.A.; Kreiter, A.; Brauman, K.A.; Keeler, B.; Arbuckle, J.; Sharma, V.; Pradhananga, A.; Noe, R.	Climatic Change	2022	10.1007/s10584-022-03320-3	3	We surveyed central Minnesota farmers about their drought risk perceptions in two groundwater management areas where climate models project heightened variability in water supply during the growing season.
2	Assessment of Prioritized Climate Smart Agricultural Practices and Technologies of Household Farmers in Southeast, Nigeria	Igberi, C.O.; Osuji, E.E.; Odo, N.E.; Ibekwe, C.C.; Onyemauwa, C.S.; Obi, H.O.; Obike, K.C.; Obasi, I.O.; Ifejimalu, A.C.; Ebe, F.E.; Ibeagwa, O.B.; Chinaka, I.C.; Emeka, C.P.O.; Orji, J.E.; Ibrahim-Olesin, S.	Universal Journal of Agricultural Research	2022	10.13189/ujar.2022.100105	4	The study assessed prioritized climate smart agricultural (CSA) practices and technologies of household farmers in Southeast, Nigeria.
2	Advanced composting technologies promotes environmental benefits and eco-efficiency: A life cycle assessment	Liu, Z.; Wang, X.; Li, S.; Bai, Z.; Ma, L.	Bioresource Technology	2022	10.1016/j.biortech.2021.126576	4	In this study, a LCA approach was conducted to investigate the eco-efficiency of four widely applied composting strategies: static heaps (SH), windrow composting (WC), membrane-covered composting (MC) and reactor composting (RC).
6	Understanding the influence of Iranian farmers' climate change beliefs on their adaptation strategies and mitigation intentions	Yazdanpanah, M.; Wheeler, S.A.; Zuo, A.; Zobeidi, T.	Climate and Development	2022	10.1080/17565529.2022.2086524	4	As part of a unique farm adaptation study in Iran, we used structural equation modelling to analyze 400 on-farm survey responses from Khuzestan Province farmers, to understand how their different types of climate change beliefs influenced their mitigation and adaptation behaviour.
6	Climate change effects on riverbank erosion Bait community flood-prone area of Punjab, Pakistan: an application of livelihood vulnerability index	Ahmad, D.; Kanwal, M.; Afzal, M.	Environment, Development and Sustainability	2022	10.1007/s10668-022-02440-1	4	The objective of this study is to investigate the effects of climate change on livelihood vulnerability in riverbank erosion Bait community flood-prone area of Punjab, Pakistan.
6	Climate change vulnerability assessment of dryland farmers and factors Identification using machine learning techniques	Kandasamy, S.U.L.; Singh, P.K.; Swain, D.K.	Local Environment	2022	10.1080/13549839.2022.2077712	4	The study aims to calculate the vulnerability level and factors affecting it in the dryland community in Southern India using Vulnerability index calculation and Machine Learning (ML) techniques.
10	Implementing Climate Change Adaptation Policies Across Scales: Challenges for Knowledge Coproduction in Andean Mountain Socio-ecosystems	Dupuits, E.; Llambí, L.D.; Peralvo, M.	Mountain Research and Development	2022	10.1659/MRD-JOURNAL-D-21-00040.1	4	This paper examines institutional challenges and local perceptions regarding the implementation of CC adaptation policies in the Andean countries.
2	Exploring Gender Dynamics in Rural Tuna Fishing Communities in the Lagonoy Gulf, Philippines	Ocampo, A.N.O.; Binondo, J.P.	Journal of International Women's Studies	2022		4	This study identifies and assesses the factors and motivations on the gender dynamics in the rural tuna fishing communities in the Lagonoy Gulf, Philippines.
6	Declining honey production and beekeeper adaptation to climate change in Chile	Gajardo-Rojas, M.; Muñoz, A.A.; Barichivich, J.; Klock-Barría, K.; Gayo, E.M.; Fontúrbel, F.E.; Olea, M.; Lucas, C.M.; Veas, C.	Progress in Physical Geography	2022	10.1177/03091333221093757	4	We evaluate the impact of climate variability on historical changes in honey production in the Mediterranean (32°S–37°S) and Temperate (37°S–41°S) regions of Chile, using annual honey production records of beekeepers together with national records of honey exports.
6	Should I Stay or Should I Go? South Indian Artisanal Fishers' Precarious Livelihoods and Their Engagement with Categorical Ocean Forecasts	Martin, M.; Abhilash, S.; Pattathil, V.; Harikumar, R.; Niyas, N.T.; Balakrishnan Nair, T.M.; Grover, Y.; Osella, F.	Weather, Climate, and Society	2022	10.1175/WCAS-D-20-0044.1	4	Our research in Thiruvananthapuram district in the southern Indian state of Kerala tested forecast quality and value and how fishers engage with forecasts.
6	Climate resilient traditional agroforestry systems in Silite district, Southern Ethiopia	Semere, M.; Cherinet, A.; Gebreyesus, M.	Journal of Forest Science	2022	10.17221/151/2021-JFS	4	Thus, this study aimed to examine the resilience of three (homegardens, woodlots, and parkland) traditional agroforestry systems (TAFS) on the basis of biomass carbon accumulation and socio-economic characteristics in Silite district, Southern Ethiopia.
6	Supporting native grasslands in Canada: Lessons learned and future management of the Prairie Pastures Conservation Area (PPCA) in Saskatchewan	Hisey, F.; Heppner, M.; Olive, A.	Canadian Geographer	2022	10.1111/cag.12768	4	We interviewed 11 individuals, including NGO representatives and pasture patrons, familiar with the PFRA at a native prairie/grassland conference to enhance our understanding of the importance of the agency and the lands in the province to them, as well as to Canada and globally.
10	Drinking water perception and consumption in Canadian subarctic Indigenous communities and the importance for public health	Ratelle, M.; Spring, A.; Laird, B.D.; Andrew, L.; Simmons, D.; Scully, A.; Skinner, K.	Facets	2022	10.1139/facets-2021-0094	4	A research study was completed to characterize the consumption of water and beverages prepared with water and identify the perception of water consumption in Indigenous communities from the Northwest Territories and Yukon, Canada.

6	Farmers' perception, awareness, and constraints of organic rice farming in Indonesia	Sujianto; Gunawan, E.; Saptana; Syahyuti; Darwis, V.; Ashari; Syukur, M.; Ariningsih, E.; Saliem , H.P.; Mardianto, S.; Marhendro	Open Agriculture	2022	10.1515/opag-2022-0090	4	This study assessed farmers' perception, motivation, constraints, awareness, and belief in adopting organic rice farming.
6	Who defines community in community-based adaptation: different perceptions of community between government and citizens in Ethiopia	Chung, J.-H.	Climate and Development	2022	10.1080/17565529.2022.2061894	4	The article sets out to critically examine, through a study of the UNDP-GEF Small Grants Programme (SGP), how the concept of community is framed within the paradigm of CBA in Ethiopia and to what extent Ethiopian peasants articulate a shape of community that they consider they belong to.
2	What are the consequences of livelihood diversification, and what solutions are suggested? Findings from Tamil Nadu, India	Sathyapriya, E.; Vengateswari, M.; Raja Priya, R.; Jacob, R.; Asokhan, M.	Asian Journal of Agriculture and Rural Development	2022	10.18488/5005.v12i1.4421	4	Understanding farmers' constraints and adaptation strategies is very important for the implementation of adequate policies for agricultural and food security. Hence, this research aims to investigate the consequences faced by farmers due to livelihood diversification and suggestions to overcome.
6	Assessment of livelihood vulnerability in the riparian region of the Tista River, West Bengal, India	Mitra, R.; Kumar Mandal, D.	GeoJournal	2022	10.1007/s10708-022-10645-0	4	The present work is conducted to assess the livelihood vulnerability based on the livelihood vulnerability index (LVI) framework of the agriculture-dependent riparian villages and the charlands of the River Tista in the Jalpaiguri district.
2	Local knowledge, perceptions and the cultural significance of the Red Panda (Ailurus fulgens) in the Himalayan Kingdom of Bhutan	Dorji, S.; Rajaratnam, R.; Tighe, M.; Vernes, K.	Biodiversity	2022	10.1080/14888386.2022.2055645	4	We investigated drivers of local knowledge, threats and cultural significance of the red panda (Ailurus fulgens) through semi-structured questionnaire surveys (N= 664 participants) on local residents in Jigme Dorji and Phrumsengla National Parks.
2	Climate Change Adaptation Strategies by Indonesian Vegetable Farmers: Comparative Study of Organic and Conventional Farmers	Irham, I.; Fachrista, I.A.; Masyhuri, M.; Suryantini, A.	Scientific World Journal	2022	10.1155/2022/3590769	3	The purpose of this study is to assess organic and conventional farmers' perception and adaptation to climate change and analyse the factors that influence such decisions. The survey was conducted in Java, involving 112 organic farmers and 112 conventional farmers.
6	Food web perspectives and methods for riverine fish conservation	Naman, S.M.; White, S.M.; Bellmore, J.R.; McHugh, P.A.; Kaylor, M.J.; Baxter, C.V.; Danehy, R.J.; Naiman, R.J.; Puls, A.L.	Wiley Interdisciplinary Reviews: Water	2022	10.1002/wat2.1590	4	In this review, we first discuss the importance of food webs in the context of several common fisheries management issues, including assessing carrying capacity, evaluating the effects of habitat change, examining species introductions or extinctions, considering bioaccumulation of toxins, and predicting the effects of climate change and other anthropogenic stressors on riverine fishes. We then examine several relevant perspectives: basic food web description, metabolic models, trophic basis of production, mass-abundance network approaches, ecological stoichiometry, and mathematical modeling.
2	Assessment of drought risk for winter wheat on the Huanghuaihai Plain under climate change using an EPIC model-based approach	Yue, Y.; Yang, W.; Wang, L.	International Journal of Digital Earth	2022	10.1080/17538947.2022.2055174	4	The present study aims to quantitatively evaluate the winter wheat drought risk under multiple climate scenarios using the Environmental Policy Impact Climate (EPIC) model.
6	Decolonizing Sociology for Social Justice in Bangladesh: Delta Scholarship Matters	Hossen, M.A.	Critical Sociology	2022	10.1177/08969205221085687	4	This paper explores a question: What are the challenges for Sociology to represent Delta people and protect their social justice? The paper depends on the content analysis of sociological practices at UofD: imperial modernity and climatic adaptation.
6	Perception and knowledge about climate change and health problems: a study in Kolkata Metropolitan Region	Mahata, D.; Shekhar, S.	GeoJournal	2022	10.1007/s10708-022-10629-0	6	Focus Group Discussion (FGD) and In-depth interviews of the participants also affirmed the fact that climate variability induced diseases and health problems in Kolkata Metropolitan areas.
6	Marketplace measurement: farmers, farmers markets and ecosystem services	DeMets, C.; Morales, A.	International Journal of Sociology and Social Policy	2022	10.1108/IJSSP-11-2021-0271	4	This study aims to consider how markets, planners and policymakers might address this gap to promote a healthy environment and climate change mitigation.
10	Co-production of climate change vulnerability assessment : A case study of the Indian Lesser Himalayan region, Darjeeling	Kumar, P.; Brewster, C.	Journal of Integrative Environmental Sciences	2022	10.1080/1943815X.2022.2033792	4	We used a mixed research approach that combines a vulnerability assessment model with a participatory knowledge approach. We based climate change vulnerability around the socio-ecological system of the mountain landscape.
10	Towards a critical pedagogy of place for environmental conservation	Ajaps, S.; Forh Mbah, M.	Environmental Education Research	2022	10.1080/13504622.2022.2050889	4	Therefore, this study employed a qualitative approach to explore teachers' perceptions of the extent to which their education system is based on local knowledge and places, and how the concept of place might be engaged as the foundation for learning.
2	Influence of Climate Change Information on Community-based Livelihood Adaptation around Lake Bosomtwe, Ghana	Kwakye, E.; Agyeman, Y.B.	International Journal of Climate Change: Impacts and Responses	2022	10.18848/1835-7156/CGP/v14i02/21-34	4	This study aimed to understand how climate information influences community-based livelihood adaptation to climate change.
2	Perceptions of ebola virus disease among the bambuti hunter group: a mixed-methods study	Forgie, E.M.E.; Masumbuko Claude, K.; Hawkes, M.T.	Pathogens and Global Health	2022	10.1080/20477724.2021.1970909	4	The second largest Ebola virus disease (EVD) epidemic occurred in the Democratic Republic of the Congo (DRC) from 2018–20. The Bambuti, a hunter population in the Ituri Forest of the DRC, may be vulnerable to the zoonotic spread of EVD due to their frequent handling of forest animals. We conducted five focus group discussions and surveyed 113 Bambuti and 91 Bantu (control group), to discern how the Bambuti perceived and responded to EVD.
1	Integrating stakeholder preferences into ecosystem services mapping in Yala wetland, Kenya	Githiora-Murimi, Y.W.; Owuor, M.A.; Abila, R.; Olago, D.; Oriaso, S.	Ecosystems And People	2022	10.1080/26395916.2022.2039774	4	This study used the matrix model combining social preferences with GIS-based maps of land use/land cover (LULC) to analyse the capacity of the Yala swamp to supply ES (flows).
1	Sorghum production in Nigeria: opportunities, constraints, and recommendations	Yahaya, M.A.; Shimelis, H.; Nebie, B.; Ojiewo, C.O.; Danso-Abbeam, G.	Acta Agriculturae Scandinavica Section B-Soil And Plant Science	2022	10.1080/09064710.2022.2047771	4	Therefore, the objective of this study was to present the current opportunities and constraints to sorghum production in Nigeria.
1	Farmer perceptions of climate, adaptation, and management of farmworker risk in California	Wadsworth, G.; Riden, H.E.; Pinkerton, K.E.	Journal Of Agriculture Food Systems And Community Development	2022	10.5304/jafscd.2022.112.015	2	In this study, semi-structured interviews were conducted with farmers and farm labor contractors in three agriculturally productive regions of California.
26	A systematic overview of the barriers to building climate adaptation of cultural and natural heritage sites in polar regions	Aktuerk, G.	Environmental Science & Policy	2022	10.1016/j.envsci.2022.05.016	8	This paper systematically reviews publications for the period 2002-2020 addressing the barriers to climate adaptation of cultural and natural heritage in the Northern and Southern poles.

1	The gap between experts, farmers and non-farmers on perceived environmental vulnerability and the influence of values and beliefs	Bergtold, J.S.; Caldas, M.M.; Ramsey, S.M.; Sanderson, M.R.; Granco, G.; Mather, M.E.	Journal Of Environmental Management	2022	10.1016/j.jenvman.2022.115186	4	This study first examines the gap between experts (scientists and other field experts) and the public (farmers and non-farmers) about the state of water and land resources, wildlife and associated habitats, and aquatic biodiversity in the Smoky Hill River Watershed in western Kansas.
1	Agroecological practices increase farmers' well-being in an agricultural growth corridor in Tanzania	Milheiras, S.G.; Sallu, S.M.; Loveridge, R.; Nnyiti, P.; Mwanga, L.; Baraka, E.; Lala, M.; Moore, E.; Shirima, D.D.; Kioko, E.N.; Marshall, A.R.; Pfeifer, M.	Agronomy For Sustainable Development	2022	10.1007/s13593-022-00789-1	4	We aim to determine the effect that farmer perception of contributions from nature, socioeconomic conditions, and farming practices, have on outcomes related to food security and human well-being.
1	Winegrowers' decision-making: A pan-European perspective on pesticide use and inter-row management	Chen, Y.; Herrera, R.A.; Benitez, E.; Hoffmann, C.; Moth, S.; Paredes, D.; Plaas, E.; Popescu, D.; Rascher, S.; Rusch, A.; Sandor, M.; Tolle, P.; Willemen, L.; Winter, S.; Schwarz, N.	Journal Of Rural Studies	2022	10.1016/j.jrurstud.2022.05.021	2	This study aims to understand winegrowers' decision-making driven by their personal characteristics, attitudes and beliefs towards viticultural practices, physical properties of vineyards, and farm management characteristics in five European winegrowing regions.
1	Adaptation to climate change risks among dairy farmers in Punjab, Pakistan	Abbas, Q.; Han, J.Q.; Bakhsh, K.; Ullah, R.; Kousar, R.; Adeel, A.; Akhtar, A.	Land Use Policy	2022	10.1016/j.lusepol.2022.106184	2	The present study is among the pioneering studies considering dairy sector in developing countries in general and Pakistan in particular. Location: Punjab.
1	The impact of coffee leaf rust on migration by smallholder coffee farmers in Guatemala	Dupre, S.I.; Harvey, C.A.; Holland, M.B.	World Development	2022	10.1016/j.worlddev.2022.105918	2	Coffee farmers
1	A decision-making framework for evaluating environmental tradeoffs in enhancing ecosystem services across complex agricultural landscapes	Triana, J.S.A.; Chu, M.L.; Shipley, N.J.; van Riper, C.J.; Stewart, W.P.; Suski, C.D.	Journal Of Environmental Management	2022	10.1016/j.jenvman.2022.115077	4	This study was aimed at establishing a decision support system that integrates hydro-ecologic models and socio-cultural perspectives to identify and assess feasible land management alternatives that can enhance the Kaskaskia River Watershed (KRW) ecosystem services in Illinois (USA).
1	Werewolves and warning signs: Cultural responses to tropical cyclones in Mauritius	Walshe, R.A.; Rouphail, R.M.; Adamson, G.C.D.; Kelman, I.	Geoforum	2022	10.1016/j.geoforum.2022.05.011	4	This article presents an examination of cultural responses to tropical cyclones on Mauritius Island in the South West Indian Ocean over the long-term.
1	Evaluation of sustainable agriculture and rural development in agro-pastoral ecotone under climate change: A comparative study of three villages in the Shenfu coalfield, China	Liu, X.Q.; Liu, Y.S.; Rui, Y.; Zhang, J.; Zhao, X.Z.	Journal Of Rural Studies	2022	10.1016/j.jrurstud.2019.12.016	3	Study in the Shenfu coalfield. Three villages that have different scales of energy development in the Shenfu coalfield are considered as case studies, and climate change and farmers' perceptions of climate change are analysed.
1	Does cooking ability affect consumer perception and appreciation of plant-based protein in Bolognese sauces?	Niimi, J.; Sorensen, V.; Mihnea, M.; Valentin, D.; Bergman, P.; Collier, E.S.	Food Quality And Preference	2022	10.1016/j.foodqual.2022.104563	4	The influence of factors such as cooking ability on hedonics and sensory discrimination of meat and meat substitutes is currently under-researched. The present study investigated such effects.
6	Promoting uptake and integration of climate smart agriculture technologies, innovations and management practices into policy and practice in Nigeria	Ifeanyi-Obi, C.C.; Issa, F.O.; Adcrinoyc-Abdulwahab, S.; Ayinde, A.F.O.; Umeh, O.J.; Tologbonse, E.B.	International Journal Of Climate Change Strategies And Management	2022	10.1108/IJCCSM-09-2021-0101	4	This study aims to explore possible ways to promote uptake and integration of climate-smart agriculture (CSA)-Technologies, Innovations and Management Practices (TIMPS) into policy and practice in Nigeria through the development of actionable roadmaps to facilitate the process.
1	Understanding rural and urban perceptions of seagrass ecosystem services for their blue carbon conservation strategies in the Philippines	Quevedo, J.M.D.; Uchiyama, Y.; Kohsaka, R.	Ecological Research	2022	10.1111/1440-1703.12325	4	Thus, in this study, we gathered rural and urban perceptions of seagrass ecosystem services, their threats, and management-related activities at the unit of barangay or village in the Philippines.
1	Overturning stereotypes: The fuzzy boundary between recreational and subsistence inland fisheries	Nyboer, E.A.; Embke, H.S.; Robertson, A.M.; Arlinghaus, R.; Bower, S.; Baigun, C.; Beard, D.; Cooke, S.J.; Cowx, I.G.; Koehn, J.D.; Lyach, R.; Milardi, M.; Potts, W.; Lynch, A.J.	Fish And Fisheries	2022	10.1111/faf.12688	4	Here, we highlight the 'fuzzy boundary' that can exist between inland recreational and subsistence fisheries and argue that unreported consumption is likely to be a hidden contributor to food security in some populations.
1	Are you prepared for the next storm? Developing social norms messages to motivate community members to perform disaster risk mitigation behaviors	Lim, J.R.; Liu, B.F.; Seate, A.A.	Risk Analysis	2022	10.1111/risa.13957	3	Then, we tested these messages through two between-subject factorial online experiments in flood- and hurricane-prone U.S. states with adult samples (N = 2,286).
1	Risk perception, farmer-herder conflicts and production decisions: evidence from Nigeria	Nnaji, A.; Ratna, N.; Renwick, A.; Ma, W.L.	European Review Of Agricultural Economics	2022	10.1093/erae/jbac012	4	This paper investigates the influence of the risk perception of farmer–herder (FH) conflicts on rural households' production decisions.
6	Key Informant Perceptions of Flooding and Landslides in Western North Carolina Following 2018 Floods and Landslides	Bonevac, A.; Shay, E.; Combs, T.	Southeastern Geographer	2022	10.1353/sgo.2022.0011	6	North Carolina
1	Farmer's perceptions on risk and determinants of risk management strategy in integrated cattle and crops farming systems	Roessali, W.; Mukson, M.; Nurfadillah, S.; Budiraharjo, K.	Journal Of The Indonesian Tropical Animal Agriculture	2022	10.14710/jitaa.47.2.146-154	2	Pattern I practice cattle-rice-corn-rice business and Pattern II practices cattle-rice-corn-soybean in Grobogan District, Central Java, Indonesia.
6	Climate and sustainability co-governance in Kenya: A multi-criteria analysis of stakeholders' perceptions and consensus	Koasidis, K.; Nikas, A.; Karamaneas, A.; Saulo, M.; Tsipouridis, I.; Campagnolo, L.; Gambhir, A.; van de Ven, D.J.; McWilliams, B.; Doukas, H.	Energy For Sustainable Development	2022	10.1016/j.esd.2022.05.003	3	No mention to small-scale populations

1	Farmers' Adaptive Behaviors to Heavy Metal-Polluted Cultivated Land in Mining Areas: The Influence of Farmers' Characteristics and the Mediating Role of Perceptions	Chen, Y.; Liang, Y.Q.; Zhou, H.; Wang, Q.Z.; Liu, Y.Z.	International Journal Of Environmental Research And Public Health	2022	10.3390/ijerph19116718	4	Perceptions on heavy metal pollution
1	Understanding Tourism Suppliers' Resilience to Climate Change in a Rural Destination in Maine	Horne, L.; De Urioste-Stone, S.; Bajgiran, P.R.; Seekamp, E.	Tourism Planning & Development	2022	10.1080/21568316.2022.2083222	4	Using socio-ecological and psychology resilience theories, we examined how a group of rural, nature-based tourism suppliers enhanced their resilience to climate change. We conducted 17 interviews in the Bay of Machias, Maine, USA to examine how characteristics of tourism suppliers influenced their resilience to climate change.
1	Relative exposure to microplastics and prey for a pelagic forage fish	Chavarry, J.M.; Law, K.L.; Barton, A.D.; Bowlin, N.M.; Ohman, M.D.; Choy, C.A.	Environmental Research Letters	2022	10.1088/1748-9326/ac7060	4	We assess the potential for the trophic transfer of microplastics through forage fishes, which are prey for diverse predators including commercial and protected species. Here, we quantify Northern Anchovy (Engraulis mordax) exposure to microplastics relative to their natural zooplankton prey, across their vertical habitat.
1	Rediscovering South Africa: Flood disaster risk management through ecosystem-based adaptation	Busayo, E.T.; Kalumba, A.M.; Afuye, G.A.; Olusola, A.O.; Ololade, O.O.; Orimoloye, I.R.	Environmental And Sustainability Indicators	2022	10.1016/j.indic.2022.100175	4	This study adopts descriptive and exploratory analytical approaches aimed at assessing the trends of flood events in South Africa and their potential risk management through EbA.
1	The contribution of the commons to the persistence of mountain grazing systems under the Common Agricultural Policy	Galan, E.; Garmendia, E.; Garcia, O.	Land Use Policy	2022	10.1016/j.lusepol.2022.106089	4	This study assesses the contribution of the commons to the persistence of mountain sheep grazing systems in Europe under the CAP.
27	Assessing Socioeconomic Risks of Climate Change on Tenant Farmers in Pakistan	Yousafzai, M.T.; Shah, T.R.; Khan, S.; Ullah, S.; Nawaz, M.; Han, H.; Ariza-Montes, A.; Molina-Sanchez, H.; Vega-Munoz, A.	Frontiers In Psychology	2022	10.3389/fpsyg.2022.870555	4	The study uses a transformative worldview to give voice to an economically marginalized group of tenant farmers vulnerable to climate changes due to their calamity prone geographical location. Drawing on anthropogenic global warming (AGW) theory lens, we examine the impact of manmade actions on climate change in District Swat and Malakand of Khyber Pakhtunkhwa (KPK) province, Pakistan using a sequential mixed methods research design.
6	Can Environmental Risk Management Improve the Adaptability of Farmer Households' Livelihood Strategies? -- Evidence From Hubei Province, China	Zhang, C.M.; Luo, X.; Song, J.H.; Fu, Z.Y.; Huang, Z.; Wang, W.	Frontiers In Environmental Science	2022	10.3389/fenvs.2022.908913	4	Based on the sustainable livelihoods framework, this paper measures the index of farmer households' livelihood strategy adaptability and analyzes the benefits of farmer households' environmental risk management on livelihood strategy adaptability by using microscopic research data of 970 farmer households' livelihoods in Hubei Province, China, in 2020.
1	Climate change and Australian general practice vocational education: a cross-sectional study	Wild, K.; Tapley, A.; Fielding, A.; Holliday, E.; Ball, J.; Horton, G.; Blashki, G.; Davey, A.; van Driel, M.; Turner, A.; FitzGerald, K.; Spike, N.; Magin, P.	Family Practice	2022	10.1093/fampra/cmac053	3	We aimed to establish the prevalence and associations of Australian GP registrars' (trainees') perceptions of climate change as it relates to public health, education, and workplaces.
6	Climate change and non-migration - exploring the role of place relations in rural and coastal Bangladesh	Rabbani, M.M.G.; Cotton, M.; Friend, R.	Population And Environment	2022	10.1007/s11111-022-00402-3	4	Through 60 semi-structured interviews of individuals from four communities in the Kalapara region, the analysis proffers four qualitatively derived and inter-related dimensions of voluntary and involuntary non-migration framed as a form of place relations.
10	Leveraging the Potential of Sorghum as a Healthy Food and Resilient Crop in the South African Food System	Pereira, L.M.; Hawkes, C.	Frontiers In Sustainable Food Systems	2022	10.3389/fsufs.2022.786151	4	This paper aims to contribute to addressing this challenge by researching sorghum (Sorghum bicolor) to identify the opportunities for innovating around sorghum as a healthy food and resilient crop.
6	Opportunities and Barriers Against Successive Implementation of Rainwater Harvesting Options to Ensure Water Security in Southwestern Coastal Region of Bangladesh	Afsari, N.; Murshed, S.B.; Uddin, S.M.N.; Hasan, M.	Frontiers In Water	2022	10.3389/frwa.2022.811918	4	This study assessed existing RWHs from several locations of Shyamnagar Upazila of Shatkhira district, incorporating social, economic, and institutional aspects along with policy and application gaps. RWH = Rainwater Harvesting
1	Understanding Principles of Environmental Racism, Climate Change, and the Blob: A Socioecological Approach in the Development of Food Justice	Hoffman, A.J.	Environmental Justice	2022	10.1089/env.2021.0114	4	This mixed-methods quasiexperimental study examined the role of community psychology in relation to increasing problems of climate change, environmental racism, sustainable food production programs, and ecojustice.
6	Rice farmers' perceptions and response to climate variability, and determinants of adaptation strategies in the Republic of Benin	Gbemavo, C.D.S.J.; Toffa, J.; Tchakpa, C.; Loko, Y.L.E.; Djedatin, G.; Ewedje, E.E.; Orobiyi, A.; Sedah, P.; Sabot, F.	International Journal Of Climate Change Strategies And Management	2022	10.1108/IJCCSM-06-2021-0059	2	The purpose of this study is to evaluate rice farmers' perceptions on the manifestations of the climate change and identify efficient strategies and determinants of adoption of these strategies in the Republic of Benin.
1	A new diminutive subterranean eel loach species of the genus Pangio (Teleostei: Cobitidae) from Southern India	Sundar, R.L.; Arjun, C.P.; Sidharthan, A.; Dahanukar, N.; Raghavan, R.	Zootaxa	2022	10.11646/zootaxa.5138.1.9	4	A second subterranean species of Pangio is described from an old dug-out well in Kerala, Southern India.
1	Historical and future spatially-explicit climate change impacts on mycorrhizal and saprotrophic macrofungal productivity in Mediterranean pine forests	Morera, A.; de Aragon, J.M.; De Caceres, M.; Bonet, J.A.; de-Miguel, S.	Agricultural And Forest Meteorology	2022	10.1016/j.agrformet.2022.108918	4	In this study, we use predictive models based on machine learning algorithms to estimate, in a spatially explicit way, the historical and future (1976-2100) evolution of mycorrhizal and saprotrophic macrofungal productivity in Mediterranean forest areas under climate change scenarios.
1	Risk perception, impact, and management by farmer households in Rajasthan (India)	Kanwal, V.; Sirohi, S.; Chand, P.	Environmental Hazards-Human And Policy Dimensions	2022	10.1080/17477891.2022.2035664	6	Location: Rajasthan is a city.
1	Floodplain farming and maladaptation to extreme rainfall events in northern Ghana	Nyantakyi-Frimpong, H.; Dinko, D.H.; Kerr, R.B.	Climate And Development	2022	10.1080/17565529.2022.2074953	4	This paper seeks to explain why agriculture in the floodplain remains so popular when it manifestly causes more problems.
1	Analysis and farmers' perception of climate change in the Kashmir Valley, India	Mahdi, S.S.; Dhekale, B.S.; Jan, R.; Bhat, M.A.; Hussain, A.; Jehangir, I.A.; Sofi, N.R.; Ahmed, L.; Qureshi, A.M.I.; Aezum, A.M.; Bangroo, S.A.; Wani, O.A.; Bahar, F.A.; Mishra, S.K.	Theoretical And Applied Climatology	2022	10.1007/s00704-022-04072-x	3	The abstract does not mention if the farmers are smallholders

1	Biocultural Drivers Responsible for the Occurrence of a Cassava Bacterial Pathogen in Small-Scale Farms of Colombian Caribbean	Perez, D.; Duputie, A.; Verniere, C.; Szurek, B.; Caillon, S.	Frontiers In Ecology And Evolution	2022	10.3389/fevo.2022.841915	4	In 2016, we analyzed the role of sociocultural and agricultural practices on CBB prevalence in small-scale fields of a village of the Colombian Caribbean region, where farmers live almost exclusively from the sale of their cassava production.
1	How social movements contribute to staying within the global carbon budget: Evidence from a qualitative meta-analysis of case studies	Thiri, M.A.; Villamayor-Tomas, S.; Scheidel, A.; Demaria, F.	Ecological Economics	2022	10.1016/j.ecolecon.2022.107356	4	This study aims to shed light on the diverse contributions of social movements to staying within the global carbon budget, as well as on the specific outcomes and strategies employed in protests against hydrocarbon activities.
1	Adaptation to Climate Change and Impact on Smallholder Farmers' Food Security in South Africa	Ogundeji, A.A.	Agriculture-Basel	2022	10.3390/agriculture12050589	4	This study explores the factors that influence smallholder farmers' adoption of climate change adaptation measures, as well as their impact on household food security.
6	Reconstitution of the Climate in the Municipality of Guimaraes (Northern Portugal): A Regional Approach Based on Historical Information and the Record of Measured Data	Nunes, L.J.R.	Climate	2022	10.3390/cli10050068	4	For the present analysis, a region in Northern Portugal was chosen, which is in the Mediterranean region, considered one of the hot spots for climate change. In this region of Entre Douro e Minho, more specifically in the municipality of Guimaraes, the climate of the last centuries was reconstructed based on documentary information and recent data collected and modeled for the region under study.
1	Studying Factors Affecting Success of Antimicrobial Resistance Interventions through the Lens of Experience: A Thematic Analysis	Graells, T.; Lambraki, I.A.; Cousins, M.; Leger, A.; Lillepold, K.; Henriksson, P.J.G.; Troell, M.; Carson, C.A.; Parmley, E.J.; Majowicz, S.E.; Wernli, D.; Jorgensen, P.S.	Antibiotics-Basel	2022	10.3390/antibiotics11050639	4	we engaged health professionals, designers, and implementers of AMR interventions in an exploratory study to learn about their experience and factors that challenged or facilitated interventions and the context in which interventions were implemented.
6	Distinguishing Allies from Enemies-A Way for a New Green Revolution	Lino-Neto, T.; Baptista, P.	Microorganisms	2022	10.3390/microorganisms10051048	4	This article is about plant-microbe interactions
1	Ion transporters and their regulatory signal transduction mechanisms for salinity tolerance in plants	Joshi, S.; Nath, J.; Singh, A.K.; Pareek, A.; Joshi, R.	Physiologia Plantarum	2022	10.1111/ppl.13702	4	In the present study, we aimed to review the regulation of uptake, transport, storage, efflux, influx, and accumulation of various ions in plants under salinity stress.
1	The influence of climate change knowledge on consumer valuation of sustainably produced rice in Vietnam	Connor, M.; Cuong, O.Q.; Demont, M.; Sande, B.O.; Nelson, K.	Sustainable Production And Consumption	2022	10.1016/j.spc.2022.01.034	2	This study investigates the relationship between climate change knowledge and consumer willingness to pay for SRP-certified rice in Vietnamese supermarkets.
1	Expanders, diversifiers or downsizers? Identifying clusters of irrigators' water trade and farm management strategies in Australia	Zuo, A.L.; Wheeler, S.A.; Xu, Y.	Agricultural Water Management	2022	10.1016/j.agwat.2022.107495	4	This study used principal component analysis to identify five clusters of southern Murray-Darling Basin irrigators from a set of twenty possible farm and water strategies during 2015-16 (n = 977).
1	Farmers' incremental adaptation to water scarcity: An application of the model of private proactive adaptation to climate change (MPPACC)	Zobeidi, T.; Yaghoubi, J.; Yazdanpanah, M.	Agricultural Water Management	2022	10.1016/j.agwat.2022.107528	4	Using the model of private proactive adaptation to climate change (MPPACC) as a basic framework for the study, the research investigated the effects of cognitive factors on maladaptation in farmers' incremental adaptation to water scarcity as a climate risk.
1	Beaver: The North American freshwater climate action plan	Jordan, C.E.; Fairfax, E.	Wiley Interdisciplinary Reviews-Water	2022	10.1002/wat2.1592	4	Beaver-based low-tech process-based stream restoration to support building climate resilience across the landscape
1	Effects of social capital on farmers' choices of climate change adaptation behavior in Dazu District, China	Li, L.; Jin, J.J.; He, R.; Kuang, F.Y.; Zhang, C.Y.; Qiu, X.	Climate And Development	2022	10.1080/17565529.2022.2061403	4	This study explores the effects of social capital on farmers' choices of climate change adaptation behavior in Dazu District, China.
1	Synchronized agricultural credit and diversification adoption to catastrophic risk manage for wheat production in Punjab, Pakistan	Ahmad, D.; Afzal, M.	Environmental Science And Pollution Research	2022	10.1007/s11356-022-20336-5	4	this study investigated the potential association and implementing synchronized agricultural credit and diversification adoption to catastrophic risk manage for wheat production in Punjab, Pakistan.
1	Environmental footprint of critical agro-export products in the Peruvian hyper-arid coast: A case study for green asparagus and avocado	Esteve-Llorens, X.; Ita-Nagy, D.; Parodi, E.; Gonzalez-Garcia, S.; Moreira, M.T.; Feijoo, G.; Vazquez-Rowe, I.	Science Of The Total Environment	2022	10.1016/j.scitotenv.2021.151686	4	The aim of the current study was to perform an environmental assessment of these two products using two life-cycle methods: carbon and water footprint.
1	Farmers' perspective towards climate change vulnerability, risk perceptions, and adaptation measures in Khyber Pakhtunkhwa, Pakistan	Shah, A.A.; Khan, N.A.; Gong, Z.; Ahmad, I.; Naqvi, S.A.A.; Ullah, W.; Karmaoui, A.	International Journal Of Environmental Science And Technology	2022	10.1007/s13762-022-04077-z	6	Since it is the center of the province, the majority of livelihoods are either businesses or workers, so agriculture takes place only in the Peshawar suburbs and remote areas.
1	Credence attributes and opportunities: a cautionary tale of yerba mate in Paraguay	Alwang, J.; Villacis, A.; Barrera, V.	Journal Of Agribusiness In Developing And Emerging Economies	2022	10.1108/JADEE-11-2021-0291	4	This study explores the determinants of growth of credence-based exports of yerba mate from Paraguay, potential for increased export growth, and the fragility of the credence-based export model.
1	The fading popularity of a local ecological calendar from Brunei Darussalam, Borneo	Bakar, N.; Franco, F.M.	Journal of Ethnobiology and Ethnomedicine	2022	10.1186/s13002-022-00525-9	4	In this article, we describe how the ecological calendar of the Kedayan people of Brunei Darussalam links skyscape and biodiversity with sociocultural aspirations to foster adaptive management of landscape, and provide an understanding of the transmission of calendric knowledge in the community.
1	Sea level rise induced impacts on coastal areas of Bangladesh and local-led community-based adaptation	Roy, B.; Penha-Lopes, G.P.; Uddin, M.S.; Kabir, M.H.; Lourenco, T.C.; Torrejano, A.	International Journal Of Disaster Risk Reduction	2022	10.1016/j.ijdrr.2022.102905	6	Our study explores how SLR has already impacted the lives and livelihoods of coastal communities in Bangladesh and how these have been responded by adopting different adaptative measures.

1	Price recovery after the flood: risk to residential property values from climate change-related flooding	Nguyen, Q.; Thorsnes, P.; Diaz-Rainey, I.; Moore, A.; Cox, S.; Stirk-Wang, L.	Australian Journal Of Agricultural And Resource Economics	2022	10.1111/1467-8489.12471	3	We take advantage of a combination of a severe weather event from 3 to 4 June 2015 and a local policy, to investigate the housing market response to climate change-related flooding hazard. The study focuses on a residential area in a low-lying coastal suburb of Dunedin, New Zealand, where the groundwater level is shallow and close to sea level.
1	Climate change perception in Romania	Cheval, S.; Bulai, A.; Croitoru, A.E.; Dorondel, S.; Micu, D.; Mihaila, D.; Sfica, L.; Tiscovschi, A.	Theoretical And Applied Climatology	2022	10.1007/s00704-022-04041-4	3	This study investigates the CC perception in Romania, based on a national-scale online survey performed in the spring of 2020, aiming to outline the prominence of environmental and CC issues, level of information and interest, perceived causes, changes perceived in meteorological phenomena at the regional scale, perceived impacts, and the psychological representation of the CC.
1	Determinants of the risk perception of farmer-herder conflicts: evidence from rural Nigeria	Nnaji, A.	International Journal Of Social Economics	2022	10.1108/IJSE-10-2021-0578	4	The purpose of this paper is to examine the social, economic and demographic determinants of rural households' risk perception of farmer-herder (FH) conflicts in Nigeria. The paper also investigates two aspects of FH conflict risk perception relating to food production and physical insecurity.
6	Climate change and pro-environmental behaviours: the significant environmental challenges of livelihoods	Abdelwahed, N.A.A.; Soomro, B.A.; Shah, N.	Management Of Environmental Quality	2022	10.1108/MEQ-10-2021-0236	3	The study investigates the intention to adopt climate change and the pro-environmental behaviours among the residents of a developing country (Pakistan) through the theory of planned behaviour (TPB).
1	Importance-performance analysis and improvement of an urban park's cultural ecosystem services based on users' perspectives: A Beijing case study	Gai, S.J.; Fu, J.M.; Rong, X.; Dai, L.L.	Journal Of Asian Architecture And Building Engineering	2022	10.1080/13467581.2022.2049800	4	this study takes a newly-built park in a complex urban block in Beijing as a case. It studies different users' perspectives of the urban park's CES using importance-performance analysis.
1	Climate change adaptation strategies of cocoa farmers in the Wassa East District: Implications for climate services in Ghana	Kosoe, E.A.; Ahmed, A.	Climate Services	2022	10.1016/j.cliser.2022.100289	2	This study investigates the perception and adaptation strategies of cocoa farmers to draw insights into climate services necessary for adaptation.
1	Quantitative and qualitative analysis of the dimensions of farmers' adaptive capacity in the face of water scarcity	Afkhami, M.; Zahraie, B.; Ghorbani, M.	Journal Of Arid Environments	2022	10.1016/j.jaridenv.2022.104715	4	The present study aims to evaluate, measure, and compare the dimensions of farmers' adaptive capacity in rural areas in west of Iran facing escalating water scarcity in the recent years.
1	A Synthesis of Laaquda(x)over-cap (Northern Fur Seal) Community Surveys and Commercial Fishery Data in the Pribilof Islands Marine Ecosystem, Alaska	Divine, L.; Williams, M.J.P.; Davies, J.; LeVine, M.; Robson, B.	Journal Of Marine Science And Engineering	2022	10.3390/jmse10040467	4	Using a co-production of knowledge approach, we explore perceptions of NFS ecology and commercial fishery interactions in the Pribilof Islands Marine Ecosystem (PRIME).
1	Content Analysis of the Problems and Challenges of Agricultural Water Use: A Case Study of Lake Urmia Basin at Miandoab, Iran	Es'haghi, S.R.; Karimi, H.; Rezaei, A.; Ataei, P.	Sage Open	2022	10.1177/21582440221091247	4	The present study aimed to identify the problems and challenges of water resources use by the agricultural sector.
1	What Affects the Livelihood Risk Coping Preferences of Smallholder Farmers? A Case Study from the Eastern Margin of the Qinghai-Tibet Plateau, China	Ma, Y.Y.; Zhao, X.Y.	Sustainability	2022	10.3390/su14084608	4	This paper takes the region located in the eastern margin of the Qinghai-Tibet Plateau in China as an example, using household survey data to analyze farmers' livelihood risk coping strategies and their key factors through a binary logistic model.
1	How well do local stakeholders' perceptions of environmental impacts of an invasive alien plant species relate to ecological data?	Bekele, K.; Linders, T.E.; Eschen, R.; Shiferaw, H.; Haji, J.; Legesse, B.; Choge, S.; Eckert, S.; Mbaabu, P.R.; Schaffner, U.	Ecological Indicators	2022	10.1016/j.ecolind.2022.108748	4	Invasive alien plant species
1	Community flood resilience assessment in Jamuna floodplain: A case study in Jamalpur District Bangladesh	Haque, M.M.; Islam, S.; Sikder, M.B.; Islam, M.S.	International Journal Of Disaster Risk Reduction	2022	10.1016/j.ijdrr.2022.102861	4	This study aims to assess the community flood resilience of some selected Upazilas of Jamalpur District in Bangladesh.
1	Structural equation model of young farmers' intention to adopt sustainable agriculture: a case study in Bangladesh	Sarkar, A.; Wang, H.Y.; Rahman, A.; Azim, J.A.; Memon, W.H.; Qian, L.	Renewable Agriculture And Food Systems	2022	10.1017/S1742170521000429	4	This paper aims to assess young farmers' willingness to adopt sustainable agriculture (SA) by implementing the expanded theory of planned behavior (TPB) within the northern region of Bangladesh.
1	Assessment of Land Use and Land Cover Changes on Soil Erosion Using Remote Sensing, GIS and RUSLE Model: A Case Study of Battambang Province, Cambodia	Sourn, T.; Pok, S.; Chou, PI.; Nut, N.; Theng, D.; Prasad, P.V.V.	Sustainability	2022	10.3390/su14074066	4	This study assessed the impact from LULC changes to soil erosion.
1	Climate Action (Goal 13): The role of climate beliefs, health security and tourism prioritisation in 30 Sub-Saharan African countries	Amadu, I.; Adongo, C.A.	Climatic Change	2022	10.1007/s10584-022-03333-y	3	The current study addressed this evidentiary deficit by examining the influence of climate beliefs, national health security and tourism prioritisation on residents' support for climate action. We used a dataset from a social survey among 20,258 climate-aware individuals in 30 SSA countries for the analyses.
1	Analysis in the Influencing Factors of Climate-Responsive Behaviors of Maize Growers: Evidence from China	Guo, H.P.; Xia, Y.J.; Pan, C.L.; Lei, Q.Y.; Pan, H.	International Journal Of Environmental Research And Public Health	2022	10.3390/ijerph19074274	2	Maize growers
1	Agronomic, genetic and chemical tools for hop cultivation and breeding	Paguet, A.S.; Siah, A.; Lefevre, G.; Sahpaz, S.; Riviere, C.	Phytochemistry Reviews	2022	10.1007/s11101-022-09813-4	4	This review presents the current challenges of hop production and appraises the tools available to investigate the genetic and chemical diversity of this plant.
1	Impacts of livelihood assets on adaptation strategies in response to climate change: evidence from Pakistan	Sargani, G.R.; Jiang, Y.S.; Chandio, A.A.; Shen, Y.; Ding, Z.; Ali, A.	Environment Development And Sustainability	2022	10.1007/s10668-022-02296-5	4	We proposed a new paradigm for the sustainable livelihoods of smallholders based on the grounded theory, to exploit seven household assets and used mixed methodological approaches of growers' livelihood assets and climatic adaptation strategies based on farmers' livelihood concerns in Sindh province of Pakistan and to better understand smallholder farmers' sustainable livelihoods and applied a partial least square path modeling.
1	Environmental and social outcomes of ecotourism in the dry rangelands of China	Li, L.; Dong, Y.X.; Zhang, T.; Wang, H.Y.; Li, H.T.; Li, A.	Journal Of Ecotourism	2022	10.1080/14724049.2022.2048841	4	This study implemented a paired experimental design to survey social-ecological impacts of ecotourism in Ergun grassland, one of China's most commended ecotourism regions.

1	An assessment of rural household vulnerability and resilience in natural hazards: evidence from flood prone areas	Fahad, S.; Hossain, M.S.; Huong, N.T.L.; Nassani, A.A.; Haffar, M.; Naeem, M.R.	Environment Development And Sustainability	2022	10.1007/s10668-022-02280-z	4	This study develops and assesses the application of a livelihood vulnerability index (LVI), LVI-IPCC and livelihood effect index for the natural and agricultural resources in Northwestern Pakistan.
1	GAM on! Six ways to explore social complexity by combining games and agent-based models	Szczepanska, T.; Antosz, P.; Berndt, J.O.; Borit, M.; Chattoe-Brown, E.; Mehryar, S.; Meyer, R.; Onggo, S.; Verhagen, H.	International Journal Of Social Research Methodology	2022	10.1080/13645579.2022.2050119	4	In a systematic literature review, we identified six research design types in empirical studies to date.
1	Diversity and distribution of dragon snakeheads of the family Aenigmachannidae, and the identity of Aeuigmachamta mahabali	Raghavan, R.; Dahanukar, N.; Anoop, V.K.; Arjun, C.P.; Britz, R.	Zootaxa	2022	10.11646/zootaxa.5120.2.10	4	Diversity and distribution of dragon snakeheads of the family Aenigmachannidae, and the identity of Aeuigmachamta mahabali
1	Economic incentives drive the conversion of agriculture to aquaculture in the Indian Sundarbans: Livelihood and environmental implications of different aquaculture types	Giri, S.; Daw, T.M.; Hazra, S.; Troell, M.; Samanta, S.; Basu, O.; Marcinko, C.L.J.; Chanda, A.	Ambio	2022	10.1007/s13280-022-01720-4	4	Based on in-depth interviews with 67 aquaculture farmers, this paper characterizes major aquaculture types in the SBR, their impacts, and identifies drivers of conversion from agricultural land.
1	Farmer's environmental orientation as an antecedent to the intention for adopting conservational agriculture practices: the moderation analysis	Gillani, S.H.M.; Kiani, M.N.; Abid, S.	International Journal Of Climate Change Strategies And Management	2022	10.1108/IJCCSM-09-2021-0106	4	This study aims to explore the antecedents of farmers' intention to adopt CAP with empirical evidence to enhance CAP in developing countries.
1	Improving fire risk communication between authorities and micro-entrepreneurs: A mental models study of Ghanaian central market fires	Nyame-Asiamah, F.; Boasu, B.Y.; Kawalek, P.; Buor, D.	Risk Analysis	2022	10.1111/risa.13911	4	This study conceptualizes how fire management authorities can empower nonexpert public to participate in fire risk communication processes and increase their own responsibilities for managing fire preventive, protective and recovery processes effectively.
1	Perceived Human-Induced Causes of Landslide in Chattogram Metropolitan Area in Bangladesh	Ahmed, Z.; Hussain, A.H.M.B.; Ambinakudige, S.; Ahmed, M.N.Q.; Alam, R.; Hafiz-Al-Rezoan.; Das Dola, D.; Rahman, M.M.; Hassan, R.; Mahmud, S.	Earth Systems And Environment	2022	10.1007/s41748-022-00304-2	4	This study investigates Land Use Land Cover changes in the Chattogram metropolitan area, the second-largest city in Bangladesh. Using a questionnaire survey of 150 local inhabitants, the study explores perceived human-induced causes of landslides.
1	Agricultural factor endowment differences and relative poverty nexus: an analysis of macroeconomic and social determinants	Song, J.X.; Geng, L.L.; Fahad, S.	Environmental Science And Pollution Research	2022	10.1007/s11356-022-19474-7	4	This research aims at exploring the impact and heterogeneity of agricultural factor endowment investment on rural relative poverty.
1	Assessing drought and its impacts on wheat yield using remotely sensed observations in rainfed Potohar region of Pakistan	Ijaz, M.; Zafar, Q.; Khan, A.A.; Hassan, S.S.	Environment Development And Sustainability	2022	10.1007/s10668-022-02200-1	4	This study aims to assist the decision-making process for drought monitoring and yield predictions, as it informs drought assessment and its impacts on crop yield using drought and vegetation indices along with climate and crop yield data.
1	Perceptions of drinking water access and quality in rural indigenous villages in Fiji	Nelson, S.; Thomas, J.; Jenkins, A.; Naivalu, K.; Naivalulevu, T.; Naivalulevu, V.; Mailautoka, K.; Anthony, S.; Ravoka, M.; Jupiter, S.D.; Mangubhai, S.; Horwitz, P.; Abimbola, S.; Negin, J.	Water Practice And Technology	2022	10.2166/wpt.2022.022	4	A mixed-methods study in six iTaukei (Indigenous Fijian) villages was conducted to understand local perceptions of drinking water access and quality, how this changes drinking water source choices, and impacts of age and gender.
1	A Comprehensive and Spatially Explicit Regional Vulnerability Assessment of the Forest Industry to Climate Change	Soucy, A.; Rahimzadeh-Bajgiran, P.; De Urioste-Stone, S.; Weiskittel, A.; Duveneck, M.J.; McGreavy, B.	Journal Of Forestry	2022	10.1093/jofore/fvab057	4	We conducted a spatially explicit vulnerability assessment of the forest industry in Maine, USA, to climate change in an effort to (1) advance a spatial framework for assessing forest industry vulnerability and (2) increase our understanding of Maine's specific vulnerabilities to climate change in order to guide decision-making.
1	Contributions of ecological programs to sustainable development goals in Linzhi, over the Tibetan Plateau: A mental map perspective	Liu, X.X.; Zhao, W.W.; Liu, Y.X.; Hua, T.; Hu, X.P.; Cherubini, F.	Ecological Engineering	2022	10.1016/j.ecoleng.2021.106532	4	Here we identify the public perception of EPs using mental maps that illustrate how people relate nine EPs to SDGs linked to nature, human well-being, and economic productivity.
1	Farmers' Perception Regarding Natural Hazards and Impact on Food Productivity: Evidence from Rice-Wheat Cropping Zone of Punjab, Pakistan	Usman, M.; Ali, A.; Hassan, S.; Bashir, M.K.	Pakistan Journal Of Agricultural Sciences	2022	10.21162/PAKJAS/22.376	2	Rice farmers.
1	What role do climate considerations play in consumption of red meat in Norway?	Vatn, A.; Aasen, M.; Thogersen, J.; Dunlap, R.E.; Fisher, D.R.; Hellevik, O.; Stern, P.	Global Environmental Change-Human And Policy Dimensions	2022	10.1016/j.gloenvcha.2022.102490	4	This paper examines factors explaining red meat consumption in Norway, especially the role of climate concerns. The paper adds to our knowledge as most existing analyses of (red) meat consumption focus on health and animal welfare issues.
1	Socio-environmental determinants of the perceived value of moist Afromontane forest ecosystem services in Kaffa Biosphere Reserve, Ethiopia	Mengist, W.; Soromessa, T.; Feyisa, G.L.; Jenerette, G.D.	Forest Policy And Economics	2022	10.1016/j.forpol.2021.102688	4	This study aimed at contributing to this knowledge gap by examining the impacts of socioenvironmental variables for the perceived use-value variation of FES.
1	Linking migration to community resilience in the receiving basin of a large-scale water transfer project	Erwin, A.; Ma, Z.; Popovici, R.; O'Brien, E.P.S.; Zanotti, L.A.; Silva, C.; Zeballos, E.Z.; Bauchet, J.; Calderon, N.R.; Larrea, G.R.A.	Land Use Policy	2022	10.1016/j.lusepol.2021.105900	4	Using this data, we analyze community resilience by identifying perceived risks, stressors, and vulnerabilities among and between groups of agricultural actors, their adaptations, and their perceptions of water management organizations' responses.

8	Changement climatique et strategies d'adaptation des exploitations irriguees privees dans le Sud-est Tunisien : Cas de la zone de Gabes-nord	Mahdhi, N.; Smida, Z.; Chouikhi, F.	New Medit	2022	10.30682/nm2201f	4	The objective of this study is to analyze the individual strategies and determinants of adaptation to climate change (CC) of irrigators in South-Eastern Tunisia.
1	Risk factors analysis for neglected human rickettsioses in rural communities in Nan province, Thailand: A community-based observational study along a landscape gradient	Chaisiri, K.; Tanganuchitcharnchai, A.; Kritiyakan, A.; Thinphovong, C.; Tanita, M.; Morand, S.; Blacksell, S.	Plos Neglected Tropical Diseases	2022	10.1371/journal.pntd.0010256	4	In this study, we estimated exposure for Scrub typhus (STG), Typhus (TG) and Spotted fever groups (SFG) rickettsia using serology at a fine scale (a whole sub-district administration level) of local communities in Nan Province, Thailand.
1	Understanding farmers' intention and willingness to install renewable energy technology: A solution to reduce the environmental emissions of agriculture	Elahi, E.; Khalid, Z.; Zhang, Z.X.	Applied Energy	2022	10.1016/j.apenergy.2021.118459	4	This study aims to understand the social acceptance of Photovoltaic (PV) water pumps in rural Pakistan and the farmers' willingness to pay extra for green electricity.
1	Improving the Representation of Climate Change Adaptation Behaviour in New Zealand's Forest Growing Sector	Villamor, G.B.; Dunningham, A.; Stahlmann-Brown, P.; Clinton, P.W.	Land	2022	10.3390/land11030364	3	To provide the forest industry with a better understanding of alternatives to simulate future adaptation pathways under evolving climatic and socio-economic uncertainty, we review the literature on how adaptation decisions are modelled in the context of plantation forests.
1	Predicting the Potential Suitable Climate for Coconut (Cocos nucifera L.) Cultivation in India under Climate Change Scenarios Using the MaxEnt Model	Hebbar, K.B.; Abhin, P.S.; Jose, V.S.; Neethu, P.; Santhosh, A.; Shil, S.; Prasad, P.V.V.	Plants-Basel	2022	10.3390/plants11060731	4	We analyzed coconut's vulnerability to climate change in India, based on climate projections for the 2050s and the 2070s under two Representative Concentration Pathways (RCPs): 4.5 and 8.5.
1	Interactions of Gibberellins with Phytohormones and Their Role in Stress Responses	Castro-Camba, R.; Sanchez, C.; Vidal, N.; Vielba, J.M.	Horticulturae	2022	10.3390/horticulturae8030241	4	In the present review, the current knowledge on gibberellins' homeostasis and modes of action is outlined. Besides this, the complex interrelations between gibberellins and other plant growth regulators are also described, providing an intricate network of interactions that ultimately drives towards precise and specific gene expression.
1	Determinants of Farmers' Awareness and Adoption of Extension Recommended Wheat Varieties in the Rainfed Areas of Pakistan	Ullah, A.; Saqib, S.E.; Kachele, H.	Sustainability	2022	10.3390/su14063194	4	This study aimed, first, to explore the relationship between the farmers' awareness and adoption of improved wheat varieties. Second, it aimed to find the key factors that govern the farmers' awareness and adoption of extension-recommended innovations in the rainfed cropping system of the Khyber Pakhtunkhwa, Pakistan.
1	First Report on Microcystin-LR Occurrence in Water Reservoirs of Eastern Cuba, and Environmental Trigger Factors	Tito, J.C.R.; Luna, L.M.G.; Noppe, W.N.; Hubert, I.A.	Toxins	2022	10.3390/toxins14030209	4	The objectives of this research were to determine the risk extension and microcystin-LR levels, and to identify the environmental factors that trigger the toxic cyanobacteria growth and microcystin-LR occurrence in 24 water reservoirs in eastern Cuba.
1	Groundwater in Crisis? Addressing Groundwater Challenges in Michigan (USA) as a Template for the Great Lakes	Steinman, A.D.; Uzarski, D.G.; Lusch, DP.; Miller, C.; Doran, P.; Zimnicki, T.; Chu, P.L.; Allan, J.; Asher, J.; Bratton, J.; Carpenter, D.; Dempsey, D.; Drummond, C.; Esch, J.; Garwood, A.; Harrison, A.; Lemke, L.D.; Nicholas, J.; Ogilvie, W.; O'Leary, B.; Sachs, P.; Seelbach, P.; Seidel, T.; Suchy, A.; Yellich, J.	Sustainability	2022	10.3390/su14053008	4	This is particularly true in the Laurentian Great Lakes (LGL) region, where the rich abundance of surface water results in the perception of an unlimited water supply but limited attention on groundwater resources.
1	Public Water Policy Knowledge and Policy Preferences in the American West	Wolters, E.A.; Steel, B.S.; Siddiqi, M.U.A.; Symmes, M.	International Journal Of Environmental Research And Public Health	2022	10.3390/ijerph19052742	3	Using random household surveys of residents in the western U.S. states of Washington, Oregon, Idaho, and California, this study explores public water knowledge, the correlates of public water knowledge, and the impact knowledge has on preferred water policies while controlling for demographic characteristics, environmental efficacy, climate change belief, and political ideology.
1	Public communication of soil conservation practices: A large-scale content analysis of Wisconsin's agricultural trade publications	Chen, K.; Shaw, B.	Journal Of Soil And Water Conservation	2022	10.2489/jSWC.2022.00167	4	We conducted a content analysis using a computational text analysis method to analyze all the online soil conservation coverage from four influential ATPs in Wisconsin.
1	From scythe to smartphone: Rural transformation in Romania evidenced by the perception of rural land and population	Petrescu-Mag, R.M.; Petrescu, D.C.; Azadi, H.	Land Use Policy	2022	10.1016/j.landusepol.2021.105851	4	The objective of the paper is twofold. Firstly, to offer benchmarks on Romania's economic literature and the modern political, economic, and social changes that have shaped today's rural communities. Secondly, to assess the importance that people assign to rural land and rural population.
1	Flood hazards and livelihood vulnerability of flood-prone farm-dependent Bait households in Punjab, Pakistan	Ahmad, D.; Afzal, M.	Environmental Science And Pollution Research	2022	10.1007/s11356-021-16443-4	4	Hence, this research work has focused to investigate livelihood vulnerability of flood-prone Bait households in southern Punjab of Pakistan.
1	Assessing farmers' awareness towards climate change in the middle part of Bangladesh	Al Mahamud, T.; Hasan, S.S.; Ghosh, M.K.; Chakma, P.	Geografia-Malaysian Journal Of Society & Space	2022	10.17576/geo-2022-1801-01	3	It is not a small-scale population.
1	Enhancing environmental resource sustainability by imagining oneself in the future	Engle-Friedman, M.; Tipaldo, J.; Piskorski, N.; Young, S.G.; Rong, C.	Journal Of Environmental Psychology	2022	10.1016/j.jenvp.2021.101746	3	This experiment assessed whether environmentally sustainable behavior can be increased by imagining oneself in the future. Participants were randomly assigned to one of three conditions in which they were directed to imagine, draw, and describe: 1) a known person in their present life (control current-other), 2) themselves in their present life (control current-self), or 3) themselves at 60 years old (experimental future-self).
1	Producer preferences for drought management strategies in the arid west	Drugova, T.; Curtis, K.R.; Ward, R.A.	Renewable Agriculture And Food Systems	2022	10.1017/S1742170521000259	4	This study uses choice experiments to assess fresh produce and hay/forage grower preferred drought management strategies, the level of drought at which growers adopt specific management strategies and the level of drought at which they choose to exit farming in the arid west.
1	Identifying Strengths and Obstacles to Climate Change Adaptation in the German Agricultural Sector: A Group Model Building Approach	Cotera, R.V.; Egerer, S.; Costa, M.	Sustainability	2022	10.3390/su14042370	4	This study focuses on North East Lower Saxony (NELS), an important agricultural region in northern Germany. We implement a novel approach to Group Model Building to assess the preparedness of NELS to deal with climate change and droughts.

1	Beef Consumers Behaviour and Preferences-The Case of Portugal	Paiva, T.; Jacinto, T.A.; Sarraguca, M.C.; Coutinho, P.	Sustainability	2022	10.3390/su14042358	4	Herein, consumers' behaviour was studied to understand if consumers would consider a change in their dietary habits by choosing beef from the Portuguese autochthonous bovine breed or even reducing their meat intake for environmental reasons.
6	Environmental drivers of herring growth and how the perception shifts with time series length	Claireaux, M.; Zimmermann, F.; Ernande, B.; Heino, M.; Enberg, K.	Canadian Journal Of Fisheries And Aquatic Sciences	2022	10.1139/cjfas-2021-0176	4	Using individual data collected over 80 years, we explored how environmental drivers affect growth in a major population of Atlantic herring (aupea harengus).
1	Perception of the local community: What is their relationship with environmental quality indicators of reservoirs?	Azevedo, E.D.L.; Romulo, R.N.A.; Dias, T.L.P.; Alvaro, E.L.F.; Barbosa, J.E.D.L.; Molozzi, J.	Plos One	2022	10.1371/journal.pone.0261945	4	This study analysed the relationship between the conservation status of reservoirs as perceived by the local community and their conservation status according to physical, chemical, and biological indicators.
1	Climate solution or corporate co-optation? US and Canadian publics' views on agricultural gene editing	Nawaz, S.; Satterfield, T.	Plos One	2022	10.1371/journal.pone.0265635	4	Across a representative sample of US and Canadian residents (n = 1478), we investigate public views and perceptions of agricultural gene editing.
1	Demystifying Drought Strategies to Enhance the Communication of a Complex Hazard	Ward, R.; Lackstrom, K.; Davis, C.	Bulletin Of The American Meteorological Society	2022	10.1175/BAMS-D-21-0089.1	4	This article highlights a project that aimed to improve the usability and dissemination of drought information for North Carolina (NC) audiences by addressing specific needs for a better understanding of how drought is monitored, the climatic and environmental conditions that can cause or worsen drought, and the impacts occurring in NC's different sectors and subregions.
1	Smallholder farmer coping and adaptation strategies for agricultural water use during drought periods in the Overberg and West Coast Districts, Western Cape, South Africa	Pili, O.; Ncube, B.	Water Sa	2022	10.17159/wsa/2022.v48.i1.3846	4	The study identified agricultural water use coping and adaptation strategies adopted by both crop and livestock smallholder farmers in the West Coast and Overberg districts during the recent 2015-2018 drought.
1	Losing Aguacate: What If Water Costs Kill Avocado Farming in San Diego County?	Balikian, R.; Genskow, K.	Case Studies In The Environment	2022	10.1525/cse.2022.1559200	4	To understand the dynamics influencing the decrease in avocado acreage, we explored the issue with avocado growers in San Diego County at the height of a drought in 2016.
1	Participatory science communication for transformation	Metcalfe, J.; Gascoigne, T.; Medvecky, F.; Nepote, A.C.	Jcom-Journal Of Science Communication	2022	10.22323/2.21020501	4	This coverage recognises the drive away from linear communication to more participatory forms of science communication. In this special edition we present practice insights, papers and essays that explore participatory science communication.
1	Assessing the Impact of Climate Resilient Technologies in Minimizing Drought Impacts on Farm Incomes in Drylands	Samuel, J.; Rao, C.A.R.; Raju, B.M.K.; Reddy, A.A.; Pushpanjali.; Reddy, A.G.K.; Kumar, R.N.; Osman, M.; Singh, V.K.; Prasad, J.V.N.S.	Sustainability	2022	10.3390/su14010382	4	In this study, we investigated the impact of drought on crop productivity, farmer's employment and income.
1	The water science communication problem: Water knowledge and the acceptance or rejection of water science	Hundemer, S.; Monroe, M.C.; Kaplan, D.	Journal Of Hydrology	2022	10.1016/j.jhydrol.2021.127230	4	This study evaluates whether such a problem exists on water topics, where it could obstruct productive discourse as new water policies are introduced.
1	Adoption of climate-smart agricultural practices among smallholder farmers in Western Kenya: do socioeconomic, institutional, and biophysical factors matter?	Musafiri, C.M.; Kiboi, M.; Macharia, J.; Ng'etich, O.K.; Kosgei, D.K.; Mulianga, B.; Okoti, M.; Ngetich, F.K.	Heliyon	2022	10.1016/j.heliyon.2021.e08677	4	What determines the adoption level and intensity of CSAPs among smallholder farmers in Kenya? While considering their joint adoption, smallholder farmers' CSAPs adoption determinants were assessed based on a sample size of 300 smallholder farmers in Western Kenya.
1	Households biogas technology adoption impact on forest conservation in Northwest Ethiopia	Mengist, M.; Akhtar, R.; Li, L.C.	Fresenius Environmental Bulletin	2022		4	This study examines the role of biogas technology adoption impacts household fuelwood consumption reduction and forest conservation in Motta district Northwest Ethiopia.
1	SWOT-FAHP-TOWS analysis for adaptation strategies development among small-scale farmers in drought conditions	Savari, M.; Amghani, M.S.	International Journal Of Disaster Risk Reduction	2022	10.1016/j.ijdrr.2021.102695	4	As very little research has been carried out on two areas, including (i) statistics and information on the status of adaptation, and (ii) the appropriate adaptation strategies for small-scale farmers under drought conditions, this paucity has increased their vulnerability level. Therefore, this study was conducted to address this gap in two steps.
10	Climate Change Resilience and Sustainable Tropical Agriculture: Farmers' Perceptions, Reactive Adaptations and Determinants of Reactive Adaptations in Hainan, China	Gao, J.; Shahid, R.; Ji, X.; Li, S.	Atmosphere	2022	10.3390/atmos13060955	3	Through a field survey of 200 farmers in Hainan, China, this study covers the methodological gap in determining the reactive adaptations for coping with the changing climate and the underlying factors of farmers' adaptive behavior.
3	Climate change awareness in educational spaces: Itaukei responses through Indigenous knowledge sharing – case study: Talanoa with Dr T podcast & Fijian communities	Tarisi, V.	Macmillan Brown Centre for Pacific Studies	2022	10.26021/12504	4	In this paper, I will be discussing how understanding climate change through digital community sharing and online classes using indigenous knowledge can be done, in order to reach out to everyone in our community, from those living in the islands to those living in the diaspora.
22	The importance of different land tenure systems for farmers' response to climate change: A systematic review	Murken, L.; Gornott, C.	Climate Risk Management	2022	10.1016/j.crm.2022.100419	8	We review the literature to understand to what extent tenure security and other land tenure characteristics affect farmers' ability to withstand climate change and how climate change is operationalised.
26	Limited integration of biodiversity within climate policy: Evidence from the Alliance of Small Island States	Strauß, L.; Baker, T. R.; de Lima, R. F.; Afionis, S.; Dallimer, M.	Elsevier	2022	10.1016/j.envsci.2021.11.019	4	Here we assessed if and how the members of the Alliance of Small Island States (AOSIS) are integrating biodiversity into their national climate action plans through forest-based climate solutions.
7	Exploring Climate Emotions in Canada's Provincial North	Galway, L. P.; Beery, T.	Frontiers in Psychology	2022	10.3389/fpsyg.2022.920313	4	Using postal survey data collected in two Provincial North communities (Thunder Bay, Ontario, and Prince George, British Columbia; N = 627), we aim to (1) describe climate emotions experienced in the context of Canada's Provincial North, including relationships among specific emotions; and (2) examine if socio-demographic variables (gender, age, and parenthood) show a relationship with climate emotions.
3	Relevance of the production system for the sustainability of conservation and breeding programs for the Creole cattle in Pasorapa, Bolivia	Bottani-Claros, G.; Jonas, E.; Strandberg, E.	Discover Sustainability	2022	10.1007/s43621-022-00085-8	4	The Creole cattle population from Pasorapa, Bolivia, is threatened by effects of climate change and unplanned crossbreeding. The aim of this study was to assess the current situation in this population and to evaluate factors to be considered before implementing conservation and genetic improvement programs in order to achieve the sustainable development goals 1, 2, 13 and 15, which refer to no poverty, zero hunger, climate change and life on land, respectively. We examined and analyzed the most important elements related to the production system and farmers' perceptions that could affect the design of such programs.

3	Perception Revitalisation and Resistance in The Swan Book	Lehartel, T.	SEPC (Société d'études des pays du Commonwealth)	2022	10.4000/ces.11355	4	This paper investigates the potential of Alexis Wright's novel The Swan Book to revitalise readers' apprehension of place, and human entanglements with the non-human world.
22	Adaptive capacity for climate change: Local initiatives and federal planning. The case of Tiksi, Sakha Republic, Russia	Da Cunha, C.; Nikulkina, I.; Vanderlinden, J.-P.; Shadrin, V.; Doloisio, N.; Salakhova, D.	Polar Science	2022	10.1016/j.polar.2021.100761	3	Semi-structured interviews were designed from pre-identified themes which aimed to identify and describe adaptation initiatives to global challenges with a special focus on climate change, specifically, identification of changes in places and activities; measures/actions implemented in order to cope with these changes; adaptation processes in the past and potential ones for the future. We contacted a sample of local stakeholders, representative of social diversity of Tiksi and its hinterland. Thus, 15 interviews of representatives from six stakeholder categories (federal authorities, state authorities, municipal authorities, Indigenous people, scientists and business) and one focus group (FG) produced a lot of dense qualitative data (see Appendix A).
3	Potential of genomics for the improvement of underutilized legumes in sub-Saharan Africa	Paliwal, R.; Adegboyega, T.T.; Abberton, M.; Faloye, B.; Oyatomi, O.	Legume Science	2022	10.1002/leg3.69	4	In this review, we focus on Bambara groundnut, African yam bean, and Kersting's groundnut. Knowledge of the challenges and rewards of exploiting them will provide opportunities for concerted approaches to their revival and contribution to future global food systems, especially in the context of climate change. This review identifies the institutional and noninstitutional challenges, the constraints, the prospects, and the rewards that can be derived from exploiting orphan legumes in SSA.
3	Institutional Innovations for Climate Smart Agriculture: Assessment of Climate-Smart Village Approach in Nepal	Ghimire, R.; Khatri-Chhetri, A.; Chhetri, N.	Frontiers in Sustainable Food Systems	2022	10.3389/fsufs.2022.734319	4	Our analysis proposes a revised conceptual model of innovation in the agricultural system that contributes to an increase in knowledge, attitude, and skills of multiple stakeholders for agricultural adaptation and the scaling of appropriate options.
29	Determinants of adoption of climate smart agricultural practices among farmers in Bale-Eco region, Ethiopia	Negera, M.; Alemu, T. ; Hagos, F.; Haileslassie, A.	Heliyon	2022	10.1016/j.heliyon.2022.e09824	4	The study applied a multivariate probit model for analyzing the simultaneous adoptions of multiple CSA practices, and ordered probit model for examining the factors influencing the level of adoptio
24	Orphan Crops: A Best Fit for Dietary Enrichment and Diversification in Highly Deteriorated Marginal Environments	Talabi, A.O.; Vikram, P.; Thushar, S.; Rahman, H.; Ahmadzai, H.; Nhamo , N.; Shahid, M.; Singh, K.R.	Frontiers in Plant Science	2022	10.3389/fpls.2022.839704	4	In this review article, the concept of orphan crops vis-à-vis marginality and food and nutritional security is defined for a few orphan crops. We also examined recent advances in research involving orphan crops and the potential of these crops for dietary diversification within the context of harsh marginal environments.
3	Ecosystem services in mountain environments: benefits and threats; Servicios ecosistémicos en áreas de montaña: beneficios y amenazas	Pereira, P.; Inacio, M.; Bogunovic, I.; Francos, M.; Barceló, D.; Zhao, W.	Pirineos	2022	10.3989/pirineos.2022.177001	4	This perspective article will study the importance of mountains to ES supply and the impacts of the different drivers of change, namely habitat change, climate change, overexploitation, pollution, and invasive species.
22	Farmers' perceptions and adoption of Coffea arabica F1 hybrids in Central America	Turreira-García, N.	World Development Sustainability	2022	10.1016/j.wds.2022.100007	2	Coffee farmers
4	Chapter 14 - Farmers' perceptions of climate hazards and coping mechanisms in Fiji	Liligeto, S.;Nakamura, N.	Current to Future Changes on a Local to Global Scale. Book: Climate Impacts on Extreme Weather	2022	10.1016/B978-0-323-88456-3.00016-2	10	The Chapter is part of the book "Climate Impacts on Extreme Weather", therefore, it will not be included in the selection.
4	Microgrid Operational Planning using a Hybrid Neural Network with Resource-aware Scenario Selection	Darville, J.; Curia, J.; Celik, N.	Simulation Modelling Practice and Theory	2022	10.1016/j.simpat.2022.102583	4	To address the need for a scalable solution method and reduced model complexity, we propose a 2-stage reconfigurable framework for near real-time MG operational planning.
4	Information transfer as a tool to improve the resilience of farmers against the effects of climate change: The case of the Peruvian National Agrarian Innovation System	Blazquez-Soriano, A.;Ramos-Sandoval, R.	Agricultural Systems	2022	10.1016/j.agsy.2022.103431	4	The aim of this study was to understand the structure of the interactions between farmers and institutions of the National Agrarian Innovation System of Peru regarding the transfer of information on preventing the effects of extreme weather events.
4	Lamprey of North America	Duncan, A.T.; Reid, A.J.	Reference Module in Earth Systems and Environmental Sciences.	2022	10.1016/B978-0-12-821139-7.00067-2	4	This study is about anthropogenic threats to lampreys
4	Climate Change and Health in the Caribbean: A review highlighting research gaps and priorities	Rise, N.; Oura, C.; Drewry, J.	The Journal of Climate Change and Health	2022	10.1016/j.joclim.2022.100126	8	A review of original research studies related to health and climate change in the Caribbean was conducted using online academic databases.
26	Does the adoption of minimum tillage improve sorghum yield among smallholders in Kenya? A counterfactual analysis	Musafiri, C.M.; Kiboi, M.; Macharia, J.;Ng'etich, O.K.;Okoti, M.;Mulianga, B.;Kosgei, D.K.;Ngetich, F.K.	Soil and Tillage Research	2022	10.1016/j.still.2022.105473	4	We assessed the effects of minimum tillage adoption on sorghum productivity among smallholder sorghum farmers in Western Kenya.
26	Analysis of provisioning ecosystem services and perceptions of climate change for indigenous communities in the Western Himalayan Gurez Valley, Pakistan	Saeed, U.; Arshad, M.; Hayat, S.; Morelli, T.L.; Ali Nawaz, M.	Ecosystem Services	2022	10.1016/j.ecoser.2022.101453	4	Article about ecosystem services.
1	Tourism impacts on small island ecosystems: public perceptions from Karimunjawa Island, Indonesia	Lukman, K.M.; Uchiyama, Y.; Quevedo, J.M.D.; Kohsaka, R.	Journal of Coastal Conservation	2022	10.1007/s11852-022-00852-9	4	We examined tourism impacts on coastal ecosystems in Karimunjawa from the perspective of local communities. More comprehensively, we investigated their perceptions from three perspectives: socio-cultural, economic, and environmental.
1	Who Makes or Breaks Energy Policymaking in the Caribbean Small Island Jurisdictions? A Study of Stakeholders' Perceptions	Liu, X.Y.; Peerally, J.A.; De Fuentes, C.; Ince, D.; Vredenburg, H.	Sustainability	2022	10.3390/su14031902	4	Departing from these two premises, our study is the first empirical attempt at examining inter-small island jurisdiction (SIJ) heterogeneity from the social construct perspective of stakeholders' perceptions and within the context of environmental sustainability and energy policymaking. We quantitatively explore, across 34 Caribbean SIJs, multiple stakeholders' perceptions of the influence of the electricity sector as a leader in environmental performance.

2	Beyond the vulnerability/resilience dichotomy: Perceptions of and responses to the climate crisis on Emau, Vanuatu	Ruehr, S.	Island Studies Journal	2022	10.24043/isj.151	3	This study explores how one village on Emau, an island offshore of capital island Efate, has developed several overlapping strategies to manage climate change impacts, including drought and sea level rise.
6	Negotiating politics and power: Perspectives on environmental justice from Jamaica's specialty coffee industry	Birthwright, A.-T.	Geographical Journal	2022	10.1111/geoj.12465	4	Through an examination of power and politics, the paper begins by contextualising the pre-existing conditions that shape the disabling environment in which smallholders operate. This includes the neoliberal restructuring of the industry, smallholders' access to low farm gate prices, expensive farm inputs, low-value chain participation, and limited support services.
2	Agreement for the Establishment of the Commission of Small Island States on Climate Change and International Law (COSIS)	Freestone, D.; Barnes, R.; Akhavan, P.	International Journal of Marine and Coastal Law	2022	10.1163/15718085-bja10087	4	This contribution outlines the content of a new agreement, signed initially by Antigua and Barbuda and Tuvalu, that establishes a Commission of Small Island States on Climate Change and International Law. This Commission has, inter alia, the express power to request an advisory opinion from the International Tribunal for the Law of the Sea (ITLOS) on issues within the ITLOS jurisdiction relating to international law and climate change. The complementary initiative by Vanuatu to seek an advisory opinion from the International Court of Justice through the UN General Assembly is also discussed.
10	The effectiveness of a biopesticide in the reduction of coffee berry borers in coffee plants	Manson, S.; Campera, M.; Hedger, K.; Ahmad, N.; Adinda, E.; Nijman, V.; Budiadi, B.; Imron, M.A.; Lukmandaru, G.; Nekaris , K.A.I.	Crop Protection	2022	10.1016/j.cropro.2022.106075	4	We assessed the effectiveness of a biopesticide on coffee berry borer (CBB; Hypothenemus hampei) presence in 57 small-holder coffee home gardens in West Java, Indonesia across three years.
6	Extreme weather events and farmer adaptation in Zeeland, the Netherlands: A European climate change case study from the Rhine delta	van Tilburg, A.J.; Hudson, P.F.	Science of the Total Environment	2022	10.1016/j.scitotenv.2022.157212	4	This study focuses on EWEs and their effect on adaptation strategies by potato and onion farmers in Zeeland, a Dutch coastal province in the Rhine delta that can serve as a model for other intensive agricultural landscapes in industrialized nations impacted by extreme weather events.
6	Knowledge for a warmer world: A patent analysis of climate change adaptation technologies	Hötte, K.; Jee, S.J.	Technological Forecasting and Social Change	2022	10.1016/j.techfore.2022.121879	4	We discuss how historical trends in environmental regulation, energy prices, and public support may have contributed to patenting in CCATs.
2	A new approach to evaluate the risk of bark beetle outbreaks using multi-step machine learning methods	Munro, H.L.; Montes, C.R.; Gandhi, K.J.K.	Forest Ecology and Management	2022	10.1016/j.foreco.2022.120347	4	Our research objective was to improve on current D. frontalis outbreak prediction models using contemporary modeling techniques.
6	How do climate change perception and value cognition affect farmers' sustainable livelihood capacity? An analysis based on an improved DFID sustainable livelihood framework	Guo, A.; Wei, Y.; Zhong, F.; Wang, P.	Sustainable Production and Consumption	2022	10.1016/j.spc.2022.08.002	3	This paper uses a survey on farmers' climate change perception and cognitive value in arid areas of Northwest China. Zhangye is a city.
6	Rancher Experiences and Perceptions of Climate Change in the Western United States	Saliman, A.; Petersen-Rockney, M.	Rangeland Ecology and Management	2022	10.1016/j.rama.2022.06.001	3	This Forum paper first summarizes recent peer-reviewed research on ranchers and climate change in the western United States and then offers conceptual clarification of climate change adaptation based on this empirical research.
6	The influence of behavioural factors and external conditions on Dutch farmers' decision making in the transition towards circular agriculture	de Lauwere, C.; Slegers, M.; Meeusen, M.	Land Use Policy	2022	10.1016/j.landusepol.2022.106253	4	This paper focuses on behavioural factors and external conditions that influence the decisions of Dutch farmers in the transition towards circular agriculture (CA).
6	Climate change affects us in the tropics: local perspectives on ecosystem services and well-being sensitivity in Southeast Brazil	Pinho, P.F.; Canova, M.T.; Toledo, P.M.; Gonzalez, A.; Lapola, D.M.; Ometto, J.P.; Smith, M.S.	Regional Environmental Change	2022	10.1007/s10113-022-01938-8	4	Inequalities in benefits from ecosystem services (ES) challenge the achievement of sustainability goals, because they increase the vulnerability of socio-ecological systems to climate hazards. Yet the unequal effects of changes in ES, and of climate change more generally, on human well-being (HWB) are still poorly accounted for in decision-making around adaptation, particularly in tropical countries. Here, we investigate these dynamics through the lens of local peoples' perceptions of ES in relation to human well-being (HWB), and how these are affected by climate change in three distinct regional case studies in the Atlantic Forest in Southeast of Brazil.
6	Climate risk perceptions and perceived yield loss increases agricultural technology adoption in the polder areas of Bangladesh	Ahmed, Z.; Shew, A.M.; Mondal, M.K.; Yadav, S.; Jagadish, S.V.K.; Prasad, P.V.V.; Buisson, M.-C.; Das, M.; Bakuluzzaman, M.	Journal of Rural Studies	2022	10.1016/j.jrurstud.2022.06.008	3	In this study, we explore how climate change perceptions of agricultural risk affect adaptation to climate change through technology adoption in a unique landscape: the polders of Bangladesh. In 2016, a survey was conducted in 1003 households living on these artificial, leveed islands facing the Bay of Bengal. We analyzed the responses from polder residents.
6	Determinants of awareness levels of climate smart agricultural technologies and practices of urban farmers in Kuje, Abuja, Nigeria	Mashi, S.A.; Inkani, A.I.; Obaro, D.O.	Technology in Society	2022	10.1016/j.techsoc.2022.102030	3	This paper evaluates the factors that influence levels of awareness of CSA technologies among urban farmers in Kuje town (Nigeria), using data collected from 491 farming households.
6	Adaptation to sustainable energy use: A case study on agricultural cooperatives	Yildirim, M.; Everest, B.	Kuwait Journal of Science	2022	10.48129/kjs.11833	4	The present research was conducted to investigate the renewable energy awareness and adaptation of managers of agricultural development cooperatives composed of farmers, the most vulnerable segment of society to climate change.
6	The oxidized cellooligosaccharides confer thermotolerance in Arabidopsis by priming ethylene via heat shock factor A2	Zarattini, M.; Choaïbi, A.; Magri, S.; Hermans, C.; Cannella, D.	Physiologia Plantarum	2022	10.1111/ppl.13737	4	The current study demonstrates the potential of cellooligosaccharides (COS), which are native and oxidized signaling molecules released by lytic polysaccharide monooxygenases (LPMO) enzymes during cell wall degradation by microbial pathogens.
6	Factors Affecting Climate-Smart Agriculture Practice Adaptation of Farming Households in Coastal Central Vietnam: The Case of Ninh Thuan Province	Duc Truong, D.; Tho Dat, T.; Huy Huan, L.	Frontiers in Sustainable Food Systems	2022	10.3389/fsufs.2022.790089	4	This study has two main objectives: to assess farmers' awareness on disasters and to analyze factors affecting the decision to apply CSA practices of farming households in Ninh Thuan.
6	Social risk perceptions of climate change: A case study of farmers and agricultural advisors in northern California	Petersen-Rockney, M.	Global Environmental Change	2022	10.1016/j.gloenvcha.2022.102557	3	I draw on an extended case study of farmers and agricultural advisors in Siskiyou County to understand how rural agriculturalists perceive risks when navigating climate change discourses.
6	Exploring Community Perceptions of Climate Change Issues in Peninsular Malaysia	Yaacob, M.; So, W.W.-M.; Iizuka, N.	Sustainability (Switzerland)	2022	10.3390/su14137756	3	The urbanization process in Peninsular Malaysia has resulted in an increase in temper-ature. Large cities such as Kuala Lumpur, Johor Bharu, and George Town are experiencing rapid urbanization processes, resulting in unpredictable changes in temperature and weather, which conse-quently impact community livelihoods. Many believe that the recent flooding in urban residential areas in Peninsular Malaysia has been worsened by climate change. Hence, this paper explores and discusses recent community perceptions of the climate change issue in Peninsular Malaysia.
2	Agronomic and on-farm infrastructure adaptations to manage economic risk in Australian irrigated broadacre systems: A case study	Monjardino, M.; Harrison, M.T.; DeVoil, P.; Rodriguez, D.; Sadras, V.O.	Agricultural Water Management	2022	10.1016/j.agwat.2022.107740	4	In this paper we advance a context-specific, system-based approach that aims to identify financially feasible irrigation designs and decision making, with the goal to increase water productivity, whole-farm profitability, and risk management.

2	Public perceptions of potential adaptations for mitigating heat stress on Australian dairy farms	Hendricks, J.; Mills, K.E.; Sirovica, L.V.; Sundermann, L.; Bolton, S.E.; von Keyserlingk, M.G.	Journal of Dairy Science	2022	10.3168/jds.2022-21813	4	The aims of this study were to determine how different proposed changes to mitigate heat stress in dairy cattle influence public perceptions toward Australian dairy farm systems, including perceptions of (1) cow welfare, (2) confidence in the industry, and (3) trust in farmers.
6	Migration among Farmers in Delta State, Nigeria: Is it a Climate Change Adaptation Strategy?	Ukaro, O.A.; Davina, O.	Journal of Agriculture and Environment for International Development	2022	10.36253/JAEID-12076	4	The study has the purpose of evaluating the nexus between climate change and migration of farmers in Delta State, Nigeria.
6	Vulnerability Assessment of Climate Change in Vietnam: A Case Study of Binh Chanh District, Ho Chi Minh City	Truong, D.D.; Dat, T.T.; Hang, N.D.; Huan, L.H.	Frontiers in Environmental Science	2022	10.3389/fenvs.2022.880254	4	This study uses the livelihood vulnerability index (LVI) to assess the level of vulnerability to climate change in households and communes in the Binh Chanh district.
2	Strengthen climate adaptation research globally: More international incentives and coordination are needed	Magnan, A.K.; Anisimov ,A.; Duvat, V.K.E.	Science	2022	10.1126/science.abq0737	4	Here, we identify opportunities associated with three scientific frontiers: understand the potential for effective climate risk reduction (including understanding maladaptation, residual risk, and adaptation limits); assess systemic, cascading, and transboundary risks; and track adaptation progress.
6	Agroforestry in Shade Coffee Plantations as an Emission Reduction Strategy for Tropical Regions: Public Acceptance and the Role of Tree Banking	Nandakishor, T.M.; Gopi, G.; Champatan, V.; Sukesh, A.; Aravind, P.V.	Frontiers in Energy Research	2022	10.3389/fenrg.2022.758372	4	This paper analyses the incentive induced “agroforestry” or “planting trees in farmland” as part of the Carbon Neutral Programme supported by the Government of Kerala in Meenangadi Grama Panchayath, Wayanad district.
6	Characterization of the Soil Prokaryotic Community With Respect to Time and Fertilization With Animal Waste–Based Digestate in a Humid Continental Climate	Suproniene, S.; Doyeni, M.O.; Viti, C.; Tilvikiene, V.; Pini, F.	Frontiers in Environmental Science	2022	10.3389/fenvs.2022.852241	4	The objective of this study was to evaluate the influence of different types of animal waste–based digestate application on soil prokaryotic diversity and composition in an agricultural cropping system over a period of 3 years, cultivated with three different annual cereal crops (spring wheat, triticale, and barley).
6	The attitudes of stakeholders and public opinion regarding the cultivation of genetically modified organisms in Cyprus	Tello, A.V.; Papamichael, I.; Zorpas, A.A.	Euro-Mediterranean Journal for Environmental Integration	2022	10.1007/s41207-022-00313-7	4	This study aims to explore the attitudes of key stakeholders (e.g., non-governmental organizations (NGOs) and politicians) and public opinion, which influence decision-making regarding the cultivation of GMOs.
6	Precipitation Patterns in the Gambia from 1981 to 2020	Ceesay, A.O.; Touray, L.M.	Geographica Pannonica	2022	10.5937/gp26-36724	4	The present study used composite analysis and rainy season definition to investigate rainfall patterns in The Gambia from 1981 to 2020.
2	No-till farming: Prospects, challenges - Productivity, soil health, and ecosystem services	Jayaraman, S.; Dalal, R.C.	Soil Research	2022	10.1071/SR22119	4	This special issue 'No-till farming: prospects, challenges - productivity, soil health, and ecosystem services' addresses and critically reviews these important issues and aims to foster awareness of NT farming. The collection of 15 papers lucidly covers various facets of NT farming. A summary and salient findings of these papers are provided in this Editorial.
2	Impressions of Coastal Communities on Climate Change and Livelihood: A Case Study of Coastal Maharashtra, India	Sharma, R.; Jagtap, S.; Rao, P.	Nature Environment and Pollution Technology	2022	10.46488/NEPT.2022.V21I02.013	4	The study uses exploratory factor analysis to better understand these implications in a regional context (EFA).
2	Quantifying risks avoided by limiting global warming to 1.5 or 2 °C above pre-industrial levels	Warren, R.; Andrews, O.; Brown, S.; Colón-González, F.J.; Forstenhäusler, N.; Gernaat, D.E.H.J.; Goodwin, P.; Harris, I.; He Y.; Hope, C.; Manful, D.; Osborn, T.J.; Price, J.; Van Vuuren, D.; Wright, R.M.	Climatic Change	2022	10.1007/s10584-021-03277-9	4	We quantify global and regional risk-related metrics associated with these levels of warming that capture climate change–related changes in exposure to water scarcity and heat stress, vector-borne disease, coastal and fluvial flooding and projected impacts on agriculture and the economy, allowing for uncertainties in regional climate projection.
2	Identification and Prediction of Crop Waterlogging Risk Areas under the Impact of Climate Change	Jin, X.; Jin, Y.; Zhai, J.; Fu, D.; Mao, X.	Water (Switzerland)	2022	10.3390/w14121956	4	This study aims to add a crop waterlogging identification module to the coupled SWAT (Soil and Water Assessment Tools)-MODFLOW (Modular Finite Difference Groundwater Flow Model) model and to accurately identify and predict crop water-logging risk areas under the CMIP6 (Coupled Model Intercomparison Project 6) climate scenarios.
6	Sustainable Livelihoods in Rural Areas under the Shock of Climate Change: Evidence from China Labor-Force Dynamic Survey	Peng, Y.; Liu, B.; Zhou, M.	Sustainability (Switzerland)	2022	10.3390/su14127262	4	Therefore, this study was grouped based on geographical location (north and south regions), and then an additional grouping was conducted according to the internal economic factors of each region. Using data from China’s labor-force dynamic survey as our sample, this study measured the sustainable livelihood in agricultural households.
6	Agricultural Disaster Risk Management and Capability Assessment Using Big Data Analytics	Wang, C.; Gao, Y.; Aziz, A.; Ogunmola, G.A.	Big Data	2022	10.1089/big.2020.0411	4	This article's primary objective is to provide technical metric analysis to analyze the body of research carried out in the past decade on different forms of disasters and the use of significant volumes.
2	Modeling and Mapping Habitat Suitability of Highland Bamboo under Climate Change in Ethiopia	Yebeyen, D.; Nemomissa, S.; Hailu, B.T.; Zewdie, W.; Sileshi, G.W.; Rodríguez, R.L.; Woldie, T.M.,	Forests	2022	10.3390/f13060859	4	This study aimed to identify potentially suitable habitats for highland bamboo in Ethiopia, determine the resilience of the species under climate change, and establish the environmental factors affecting its habitat.
6	Climate Risks and Opportunities of the Marine Fishery Industry: A Case Study in Taiwan	Ho, C.-H.	Fishes	2022	10.3390/fishes7030116	3	Recently, both long-term climate change and extreme climate hazards have led to shocks in the marine fishery industry. The resulting instability of the industry directly affects the market supply of and demand for seafood. We conduct a case study of a marine fishery industry in Taiwan that in-corporates social concern assessments of risk perception and judgements of risk acceptance through risk management processes. Furthermore, we incorporate stakeholder participatory processes to re-duce the gap in awareness of adaptation and to increase the opportunity to reach consensus and develop an integrated risk management model that enables decision-makers to better meet the needs of society.
2	Assessment of Local Knowledge about Land Use Relevant to Landscape Planning in a Case Study Area in Lowland Slovakia	Dobrovodská ,M.; Moyzeová, M.; Bezák ,P.; Mojses, M.	Journal of Landscape Ecology(Czech Republic)	2022	10.2478/jlecol-2022-0004	4	This paper analyses the results of sociological research with regard to landscape development in Nová Vieska village in the Podunajská níA34ina lowland in Slovakia.
2	The role of human-induced climate change in heavy rainfall events such as the one associated with Typhoon Hagibis	Li, S.; Otto, F.E.L.	Climatic Change	2022	10.1007/s10584-022-03344-9	4	In this paper we use a multi-method probabilistic event attribution framework to assess the role of human-induced climate change in the heavy rainfall event responsible for a large proportion of the damages.
2	The Challenges of Working in the Heat Whilst Pregnant: Insights From Gambian Women Farmers in the Face of Climate Change	Spencer, S.; Samateh, T.; Wabnitz, K.; Mayhew, S.; Allen, H.; Bonell, A.	Frontiers in Public Health	2022	10.3389/fpubh.2022.785254	4	This research project aims to answer the question of whether and how pregnant farmers in The Gambia perceive and act upon occupational heat stress and its health impacts on both themselves and their unborn children, against the backdrop of current and expected climatic changes.

21	Socio-demographic, institutional and governance factors influencing adaptive capacity of smallholder irrigators in Zimbabwe	Mwadzingeni, L.; Mugandani, R.; Mafongoya, P.L.	PloS one	2022	10.1371/journal.pone.0273648	4	In order to close this the gap, this study seeks to explore how socio-demographic, governance and institutional factors influence adaptive capacity in Exchange, Insukamini and Ruchanyu irrigation schemes.
2	Climatic variations and livelihood adaptations in cryosphere district of Uttarkashi, Uttarakhand: A local public perception approach	Pandey, B.W.; Negi, V.S.; Ranjan, O.J.; Yadav, G.; Prakash, P.	Transactions of the Institute of Indian Geographers	2022		4	This paper is a perception-based study that aims at understanding the impact of climatic variability on livelihood opportunities in the Cryosphere highland of mid-Himalayan region
6	Investigating the relationship between land alteration and the urban heat island of Seville city using multi-temporal Landsat data	Halder, B.; Karimi, A.; Mohammad, P.; Bandyopadhyay, J.; Brown, R.D.; Yaseen, Z.M.	Theoretical and Applied Climatology	2022	10.1007/s00704-022-04180-8	4	The study investigated the properties of land alteration on the urban heat island (UHI) in the city of Seville, Spain.
2	Social-ecological services in the rangeland ecosystem: a case study of the Al-Sorrah Rangeland Reserve in Jordan	Al-Assaf, A.; Al-Khalidi, K.; Parker, T.; Tadros, M.; Majdalawi, M.	Journal of Sustainability Science and Management	2022	10.46754/jssm.2022.07.006	4	Therefore, this study aims to investigate how different social-ecological systems (SES) influence human actions and perceptions toward rangeland ecosystems.
6	Protected Area Politics in the American West: Framing Bears Ears National Monument in Local News	Macary, J.T.; Gillig, T.K.	Journalism Practice	2022	10.1080/17512786.2022.2075784	4	The US President Joe Biden redesignated Bears Ears National Monument in southeastern Utah after former President Barack Obama designated it and former President Donald Trump reduced it in size. The designation, reduction, and redesignation of the monument, designed to protect Indigenous archaeological sites, catalyzed debate covered by local news. Using the frame matrix method to qualitatively analyze language in local news articles, this study increases understanding of political and cultural meanings associated with the monument.
2	Climate Change Adaptation and Mitigation Strategies in Madda Walabu District, Bale Zone, Southeast Ethiopia	Abdela, U.	International Journal of Ecology	2022	10.1155/2022/5658440	4	The objective of the study was to investigate climate change adaptation and mitigation strategies for the synergy of the communities in the Madda Walabu District.
6	Exploring the drivers of herbicide use and risk perception among smallholder farmers in Ghana	Kpienbaareh, D.; Kansanga, M.M.; Yiridoe, E.; Luginaah, I.	Gender, Technology and Development	2022	10.1080/09718524.2022.2092939	4	Drawing theoretical insights from political ecology and using photovoice and interviews with (N = 48) backyard farmers in the semi-arid savannah region of Ghana, this article explored the underlying factors shaping herbicide adoption and the perceived health and environmental impacts.
10	Is there any gender difference in environmental concern? Evidence from the smallholder farmers in Oromia regional state of Ethiopia	Huluka, A.T.	Cogent Social Sciences	2022	10.1080/23311886.2022.2103284	4	Understanding and closing the gender gap in environmental concern is the only way to identify and implement the best policies for the environment and sustainable development. This paper examines the gender difference in environmental concern in the case of Ethiopia, Oromia regional state.
6	The perception and determinants of agricultural technology adaptation of teff producers to climate change in North Shewa zone, Amhara Regional State, Ethiopia	Emeru ,G.M.	Cogent Economics and Finance	2022	10.1080/23322039.2022.2095766	4	The purpose of this study is to examine the perception and determinants of agricultural technology adaptation of teff producers to climate change in North Shewa zone, Ethiopia.
2	Risk of Legionellosis in residential areas around farms irrigating with municipal wastewater	Mori ,J.; Smith, R.L.	Risk Analysis	2022	10.1111/risa.13997	4	To assess an individual adult's risk of infection with L. pneumophila from a single exposure to agricultural spray irrigation, a quantitative microbial risk assessment was conducted for a scenario of spray irrigation in central Illinois, for the growing seasons in 2017, 2018, and 2019.
6	China and changing food trends: A sustainability transition perspective	Marinova, D.; Bogueva, D.; Wu, Y.; Guo, X.	Ukrainian Food Journal	2022	10.24263/2304-974X-2022-11-1-13	4	Article about the characteristics of four transition theories related to food are outlined to help explain population behaviour, namely demographic, nutrition/protein, food and sustainability transition. This is followed by a further desktop analysis of the changes occurring in China, the world's largest demography, and this country's contribution to a most-needed global sustainability transition.
6	Assessing household perception, autonomous adaptation and economic value of adaptation benefits: Evidence from West Coast of Peninsular Malaysia	Ehsan, S.; Begum, R.A.; Abdul Maulud, K.N.; Mia, M.S.	Advances in Climate Change Research	2022	10.1016/j.accre.2022.06.002	4	Thus, this study assesses households' perception, adaptation measures and empirically estimates willingness to pay and preference for planned adaptation measures to guide policy instruments through public engagement.
6	Determinants of risk attitude and risk perception under changing climate among farmers in Punjab, Pakistan	Farhan, M.; Yasin, M.A.; Bakhsh, K.; Ali, R.; Ullah, S.; Munir, S.	Natural Hazards	2022	10.1007/s11069-022-05465-x	6	Location: The study was conducted in three districts of Punjab such as Bahawalpur, Layyah and Rahim Yar Khan.
16	For sustainable social impact at Mangalajodi: change processes enabled by NatWest Bank India	Roy, V.D.	Emerald Emerging Markets Case Studies	2022	10.1108/EEMCS-04-2021-0109	3	The case study explains to the students how the PSC levers of motivation, capability and opportunity structures were applied by NatWest Bank during different phases of project execution. As management grapples with new problems, the students are encouraged to use the levers to recommend an action plan. It allows students to apply SWOT and think of competitive strategies for MET. It allows students to think of strategies that may apply for a better management of Ecotourism at Mangalajodi.
6	Analysing the variation in farmers' perceptions of climate change impacts on crop production and adaptation measures across the Ganges' Tidal Floodplain in Bangladesh	Khan, R.M.; Zulfiqar, F.; Datta, A.; Kuwornu, J.K.M.; Shrestha, S.	Local Environment	2022	10.1080/13549839.2022.2091528	4	To unlock the local level context-specific nature of adaptation, the study area covered two distinct zones of the GTF: interior zone, surrounded by the Sundarbans mangrove forest, and exterior zone being more exposed to the Bay of Bengal. An analysis of the differences in empirical climate parameter trends and farmers' adaptations to adjust to these changes in the two sample study areas (one from each zone) was conducted.
2	Aligning Trends in Climatic Parameters and Nomads' Indigenous Knowledge about Climate Change in Central Iran (Case Study: Semirom town)	Saboohi, R.; Barani, H.; Khodagholi, M.; Sarvestani, A.A.; Tahmasebi, A.; Feuer, H.N.	Weather, Climate, and Society	2022	10.1175/WCAS-D-21-0041.1	4	This research aims to assess the scope and applicability of climate change related knowledge acquired in the management of summer rangeland, with a case study in Semirom, Isfahan Province, Iran.
6	Can perceptions of reduction in physical water availability affect irrigation behaviour? Evidence from Jordan	Kafle, K.; Balasubramanya, S.	Climate and Development	2022	10.1080/17565529.2022.2087587	4	We investigate how farmers' past experiences of physical water availability are related to their current behaviour, by examining the frequency of irrigation and how farmers determine irrigation needs.
6	Changes in Sharing and Participation are Important Predictors of the Health of Traditional Harvest Practices in Indigenous Communities in Alaska	Brinkman, T.; Charles, B.; Stevens, B.; Wright, B.; John, S.; Ervin, B.; Joe J.; Ninguelook, G.; Heeringa, K.; Nu J.; Chapin, T.; Rasmus, S.	Human Ecology	2022	10.1007/s10745-022-00342-4	4	The well-being of Indigenous communities in Alaska is inextricably linked to traditional harvest practices (THPs) such as hunting, fishing, and gathering local wild foods. Regional trends in the health of THPs have not been quantitatively evaluated in Alaska. Therefore, we surveyed Indigenous residents in the Western Coastal (n = 623) and Interior (n = 437) Regions of Alaska to estimate perceptions of the extent and cause of change in the health of THPs over the last ten years.

6	Opportunity cost of adopting improved planted forage: Evidence from the adoption of Brachiaria grass among smallholder dairy farmers in Kenya	Maina, K.W.; Ritho, C.N.; Lukuyu, B.A.; Rao, E.J.O.	African Journal of Agricultural and Resource Economics	2022	10.53936/afjare.2022.17(1).3	4	The study utilised full-information endogenous switching regression to compute the opportunity cost by comparing the gross margins generated from Napier and Brachiaria grass.
6	Comparison of ecosystem services provided by an urban and a riverine wetland: a multi-scale evaluation from lower Gangetic plain, Eastern India	Das, A.; Das, M.; Gupta, R.	Environmental Science and Pollution Research	2022	10.1007/s11356-022-21230-w	4	This study aims to compare a peri-urban wetland with a riverine wetland from lower Gangetic plain, Eastern India, to identify the bundle of ES based on its perceived importance from multiple perspectives at a local level.
2	Comparative analysis of the sustainable dimensions of food security with COVID-19 and climate change: A case study	Igberi, C.O.; Omenyi, L.O.; Osuji, E.P.; Egwu, P.N.; Ibrahim-Olesi, S.	International Journal of Advanced and Applied Sciences	2022	10.21833/ijaas.2022.06.002	4	This study examined the comparative analysis of the sustainable dimension of food security with COVID-19 and climate change in the Ebonyi State of Nigeria.
2	A Survey of Broiler Farmers' Perceptions of Animal Welfare and their Technical Efficiency: A Case Study in Northeast China	Jo, H.; Nasrullah, M.; Jiang, B.; Li, X.; Bao, J.	Journal of Applied Animal Welfare Science	2022	10.1080/10888705.2021.1912605	4	This study was conducted to assess the current status of famers' perceptions of animal welfare and technical efficiency in broiler farms using a stochastic frontier analysis (SFA).
1	Planned climate adaptation interventions and smallholder farmer output levels in the Upper East Region, Ghana	Kangah, H.; Agyenim, J.B.	Cogent Social Sciences	2022	10.1080/23311886.2022.2108214	4	This study investigated the effects of planned climate variability adaptation interventions on smallholder farmer output in the Bolgatanga and Garu and Tempani districts of the Upper East Region, Ghana.
6	Multi-sectoral impact assessment of an extreme African dust episode in the Eastern Mediterranean in March 2018	Monteiro, A.; Basart, S.; Kazadzis, S; Votzis, A.; Gkikas, A.; Vandenbussche, S; Tobias, A.; Gama, C.; Garcia-Pando, C.P.; Terradellas, E.; Notas, G.; Middleton, N.; Kushta, J.; Amiridis, V; Lagouvardos, K.; Kosmopoulos, P.; Kotroni, V.; Kanakidou, M.; Mihalopoulos, N.; Kalivitis, N.; Dagsson-Waldhauserova, P.; El-Askary, H.; Sievers, K.; Giannaros, T.; Mona, L.; Hirtl, M.; Skomorowski, P.; Nickovic, S.; Votsis, A.; Virtanen, T.H.; Christoudias, T.; Di Mauro, B.; Trippetta, S.; Kutuzov, S.; Meinander, O.	Science of the Total Environment	2022	10.1016/j.scitotenv.2022.156861	4	Our study fills a gap in dust research by assessing the multi-sectoral impacts of sand and dust storms and their socioeconomic implications. Specifically, we provide a multi-sectoral impact assessment of Crete during the occurrence of this exceptional African dust event.
1	Nesting range expansion of loggerhead turtles in the Mediterranean: Phenology, spatial distribution, and conservation implications	Hochscheid, S.; Maffucci, F.; Abella, E.; Bradai, M.N.; Camedda, A; Carreras, C; Claro, F.; de Lucia, G.A.; Jribi, I.; Mancusi, C.; Marco, A.; Marrone, N.; Papetti, L.; Revuelta, O.; Urso, S.; Tomas, J.	Global Ecology and Conservation	2022	10.1016/j.gecco.2022.e02194	4	We compiled information on nesting activity from beaches surrounding the Western Mediterranean and collected metadata on loggerhead turtle nests in Spain, France, Italy, and Tunisia between 2010 and 2020 to provide an exhaustive overview on the phenomenon of emerging new nest sites for loggerhead turtles.
1	Incorporating fishers' evaluation of adaptive capacity in policy making in Thailand	Satumanatpan, S.; Pollnac, R.; Chuenpagdee, R.	Fisheries Research	2022	10.1016/j.fishres.2022.106407	4	The paper presents a study of twelve small-scale fishing communities in eastern Thailand, which illustrates the multiplicity of factors influencing attitudes, beliefs, values and cognitive biases (ABVCs) concerning adaptive capacity.
10	Physical and feasible: Climate change adaptation in Longyearbyen, Svalbard	Meyer, A.	Polar Record	2022	10.1017/S0032247422000079	3	The research consists of ethnographic fieldwork and interviews with planners, engineers, architects, scientists, construction workers and local politicians.
1	A methodological framework for modeling sustainability visions: A case study of groundwater management in Faizpur distributary, Pakistan	Noor, R.; Inam, A.; Zahra, S.M.; Shoaib, M.; Riaz, R.; Sarwar, A.; Asif, M.; Ahmad, S.	Agricultural Water Management	2022	10.1016/j.agwat.2022.107822	4	The proposed research aims to develop a stepwise participatory modeling framework with special focus to the problem of groundwater depletion in the Faizpur distributary of Bari Doab basin, Pakistan.
1	The Influence of Evangelical and Political Identity on Climate Change Views	Lowe, B.S.; Israel, G.D.; Paudyal, R.; Wallen, K.E.	Society & Natural Resources	2022	10.1080/08941920.2022.2113486	3	This study uses data from a probability-based mail survey of residents in the political swing state of Florida, USA to examine the relationships between evangelical identity, religiosity, partisan affiliation and three measures of climate-related views: global warming knowledge, belief, and risk perception.
1	Climate Change Consciousness: An Exploratory Study on Farmers' Climate Change Beliefs and Adaptation Measures	Petrescu-Mag, R.M.; Petrescu, D.C.; Azadi, H.	Society & Natural Resources	2022	10.1080/08941920.2022.2113006	3	For this, Romanian farmers' level of climate change consciousness was assessed considering three layers: affective, cognitive, and conative. The "Introduction of new crops (not GMOs)" was the climate change adaptation measure adopted by most farmers.
1	Rural vulnerability to water scarcity in Iran: an integrative methodology for evaluating exposure, sensitivity and adaptive capacity	Moshizi, M.Z.; Yousefi, A.; Amini, A.M.; Shojaei, P.	Geojournal	2022	10.1007/s10708-022-10726-0	4	This study assessed vulnerability to water scarcity in six rural regions of Isfahan, Iran.
1	Potential for the adoption of measures to reduce N2O emissions from crop residues in Denmark	Notaris, C.D.; Abalos, D.; Mikkelsen, M.H.; Olesen, J.E.	Science of the Total Environment	2022	10.1016/j.scitotenv.2022.155510	4	Using Denmark as a case study, we combined a survey (completed by 592 farmers) and national data to assess the practical potential and obstacles for the successful implementation of management strategies to reduce N2O emissions from crop residues.
1	Determinants of households' livelihood diversification strategies to adapt to natural hazards: evidence from ecologically vulnerable haor region of Bangladesh	Hoq, M.S.; Uddin, M.T.; Raha, S.K.; Hossain, M.I.	Natural Hazards	2022	10.1007/s11069-022-05514-5	4	The study's aim to evaluate the various livelihood strategies adopted by haor households, and multinomial logistic regression is employed to identify the factors influencing their decision to pursue more eco-friendly and sustainable livelihood strategies.
1	Peer effects in disaster preparedness: whether opinion leaders make a difference	He, J.; Zhuang, L.M.; Deng, X.; Xu, D.D.	Natural Hazards	2022	10.1007/s11069-022-05550-1	4	Based on the survey data of 327 residents in Wenchuan and Lushan County, Sichuan earthquake-stricken areas in 2019, the research analyzed the influence of peer effects on disaster preparedness and its mechanism by using instrumental variable method.

1	The comparative performance of land sharing, land sparing type interventions on place-based human well-being	Carmenta, R.; Steward, A.; Albuquerque, A.; Carneiro, R.; Vira, B.; Carmona, N.E.	People and Nature	2022	10.1002/pan3.10384	4	Furthermore, little is known about the comparative performance of distinct interventions along a land-sharing, versus land sparing gradient, on local definitions of HWB. We address this knowledge gap, adopting a perception-based impact evaluation within communities across four intervention types representing the land sparing, sharing gradient: intensified industrial soy production (n = 60 HHs), a protected area (n = 70), an extractive reserve (n = 70) and a national forest (n = 70) in Para in the Brazilian Amazon
1	Foresighting future climate change impacts on fisheries and aquaculture in vietnam	Tran, N.; Chan, C.Y.; Aung, Y.M.; Bailey, C.; Akester, M.; Le Cao, Q.; Trinh, T.Q.; Hoang, C.V.; Sulser, T.B.; Wiebe, K.	Frontiers in Sustainable Food Systems	2022	10.3389/fsufs.2022.829157	4	This study investigates the prospective climate change impacts on Vietnam's fisheries sector, focusing on four key commodities including capture fisheries (tuna), freshwater aquaculture (pangasius catfish and tilapia), and brackish water aquaculture (shrimp).
27	Pilot-Scale Vinification of Cabernet Sauvignon Using Combined Lactiplantibacillus plantarum and Saccharomyces cerevisiae to Achieve Wine Acidification	Jiang, J.; Zhang, W.J.; Wu, Y.T.; Shi, X.R.; Yang, X.B.; Song, Y.Y.; Qin, Y.; Ye, D.Q.; Liu, Y.L.	Foods	2022	10.3390/foods11162511	4	Here, we evaluated acidification and fermentation performance of indigenous L. plantarum in two inoculation regimes (i.e., reverse inoculation and co-inoculation) by conducting pilot-scale vinification using Cabernet Sauvignon with low acidity.
1	Land Use Change and Prediction for Valuating Carbon Sequestration in Viti Levu Island, Fiji	Avtar, R.; Rinamalo, A.V.; Umarhadi, D.A.; Gupta, A.; Khedher, K.M.; Yunus, A.P.; Singh, B.P.; Kumar, P.; Sahu, N.; Sakti, A.D.	Land	2022	10.3390/land11081274	4	This study examines land use changes and evaluates the past and projected forest carbon sequestration and its valuation in Viti Levu Island, Fiji, through a combination of remote sensing with a geospatial-based modeling approach.
6	A Long Way toward Climate Smart Agriculture: The Importance of Addressing Gender Inequity in the Agricultural Sector of Guatemala	Mosso, C.; Pons, D.; Beza-Beza, C.	Land	2022	10.3390/land11081268	4	This study analyzed the barriers and opportunities for the implementation of gender-sensitive CSA strategies in rural Guatemala, a low-latitude country with a high gender gap index, through the perceptions of agricultural extensionists.
6	Drivers of Environmental Conservation Agriculture in Sado Island, Niigata Prefecture, Japan	Maharjan, K.L.; Gonzalvo, C.M.; Aala, W.F.	Sustainability	2022	10.3390/su14169881	4	Sado Island in the Niigata prefecture in Japan is one of the first Globally Important Agricultural Heritage Systems (GIAHS) among developed countries and has since been involved in environmental conservation agriculture (ECA). While ECA is still in its early stage in Japan, it has proven to be effective in mitigating climate change in the agricultural sector; hence, this study aimed to identify drivers of ECA among Sado Island paddy farmers.
1	Adapting to Social-Ecological Risks to the Conservation of a Muskmelon Landrace in India	Singh, A.; Singh, R.K.; Kumar, N.; Kumar, S.; Sheoran, P.; Singh, D.; Kumar, S.; Sharma, P.C.	Sustainability	2022	10.3390/su14169880	4	Crop landraces are vanishing alarmingly worldwide, posing serious risks to the livelihoods of the resource-poor farmers; this study, conducted using 'vulnerability' and 'resilience theory' frameworks, sought to delineate social-ecological, climatic and policy hindrances to the conservation of a muskmelon landrace 'Jaunpuri Netted' traditionally grown in eastern Uttar Pradesh, India.
10	Gender Dimensions of Climate Change Adaptation Needs for Smallholder Farmers in the Upper East Region of Ghana	Nuhu, M.G.; Matsui, K.	Sustainability	2022	10.3390/su141610432	4	To better understand how and what gender dimensions can be important factors for farmer's climate change adaptations, this study attempts to examine smallholder farmers' adaptation needs and perspectives in Ghana's Upper East Region.
1	Livelihood, carbon and spatiotemporal land-use land-cover change in the Yenku forest reserve of Ghana, 2000-2020	Acheampong, J.O.; Attua, E.M.; Mensah, M.; Fosu-Mensah, B.Y.; Apambilla, R.A.; Doe, E.K.	International Journal of Applied Earth Observation and Geoinformation	2022	10.1016/j.jag.2022.102938	4	This study examines the extent of LULCC, AGBCS and perception of livelihood effects on the Yenku Forest Reserve (YFR) in the Central Region of Ghana.
6	System Thinking Approach toward Reclamation of Regional Water Management under Changing Climate Conditions	Sheikhbabaei, A.; Baghanam, A.H.; Zarghami, M.; Pouri, S.; Hassanzadeh, E.	Sustainability	2022	10.3390/su14159411	4	This paper represents a streamflow prediction model with the approach of ensemble multi-GCM downscaling and system dynamics (SD) for the Aji-Chay watershed located in northwest Iran.
1	Farmers adapt to climate change irrespective of stated belief in climate change: a California case study	Petersen-Rockney, M.	Climatic Change	2022	10.1007/s10584-022-03417-9	3	This article draws on ethnographic methods, including 108 interviews with crop and livestock farmers and key informants, to query climate change experience, belief, and response in rural northeastern California.
1	Impacts of disaster and land-use change on food security and adaptation: Evidence from the delta community in Bangladesh	Parven, A.; Pal, I.; Witayangkurn, A.; Pramanik, M.; Nagai, M.; Miyazaki, H.; Wuthisakkaroon, C.	International Journal of Disaster Risk Reduction	2022	10.1016/j.ijdrr.2022.103119	4	The study looked at shifting patterns of land use, the state of food security, and adaption mechanisms in pre-and post-disaster contexts to anticipate the future situation and its influence on livelihood.
1	Assessing the Impact of Offshore Wind Power Deployment on Fishery: A Synthetic Control Approach	Shimada, H.; Asano, K.; Nagai, Y.; Ozawa, A.	Environmental & Resources Economics	2022	10.1007/s10640-022-00710-0	4	To date, there is no body of knowledge on the causal impact of offshore wind farm installation on local fisheries. Using fishery production panel data at the municipality level in Japan, this study applies a synthetic control method to measure causal impacts.
1	Restoration of coastal ecosystems as an approach to the integrated mangrove ecosystem management and mitigation and adaptation to climate changes in north coast of East Java	Rudianto, R.; Darmawan, V.; Isdianto, A.; Bintoro, G.	Journal of Coastal Conservation	2022	10.1007/s11852-022-00865-4	4	This study aims to determine public awareness of the occurrence of tidal flooding and tsunami and to find an easy and inexpensive way to overcome it.
1	Impact of climate smart agriculture on food security: An agent-based analysis	Bazzana, D.; Foltz, J.; Zhang, Y.	Food Policy	2022	10.1016/j.foodpol.2022.102304	4	The analysis investigates the role of social and ecological pressures (i.e. community network, climate change and environmental externalities) on the adoption of physical water and soil practices as well as crop rotation techniques in rural Ethiopia.
1	Resident perceptions of riverbank erosion and shoreline protection: a mixed-methods case study from Bangladesh	Rahman, M.; Popke, J.; Crawford, T.W.	Natural Hazards	2022	10.1007/s11069-022-05489-3	4	Our study combines quantitative analysis of data from a household survey with qualitative data from semi-structured interviews to assess resident perceptions of the new revetment and its effect on the landscape of riverbank erosion hazard.
1	Understanding conflict and co-existence among Spiti Bhot community and large carnivores in high Himalaya: The case of Himalayan wolves	Lyngdoh, S.; Habib, B.	Frontiers in Ecology and Evolution	2022	10.3389/fevo.2022.739181	4	In this study, we determine wolf movement and analyze diet patterns in contrast with studies from within its distribution range. We determine conflict perception and identify hotspots using ecological, social, and remotely sensed information. Wolf diet (n = 283 scats) constituted mostly of domestic prey (79%), while wild prey constituted 17.8% of the wolf diet. Interview-based questionnaire surveys revealed that 55% of the respondents claimed to have seen wolves.
1	Wetland health, water quality, and resident perceptions of declining ecosystem services: a case study of Mount Abu, Rajasthan, India	Imdad, K.; Rihan, M.; Sahana, M.; Parween, S.; Ahmed, R.; Costache, R.; Chaudhary, A.; Tripathi, R.	Environmental Science and Pollution Research	2022	10.1007/s11356-022-21902-7	4	The present study attempts to assess the changing nature of wetland health, water quality, and declining ecosystem services of Mount Abu wetlands in Rajasthan, India.
1	Does Precision Matter? A Q Study of Public Interpretations of Gene Editing in Agriculture	Nawaz, S.; Satterfield, T.; Phurisamban, R.	Science Technology & Human Values	2022	10.1177/01622439221112460	4	We offer an exploratory Q study that investigates how one public group applies interpretive frames to understand applications of novel GE and related technologies.

1	Species conservation target for freshwater fishes inhabiting Bengal sub-tropical montane rivers of Eastern Himalayas: an indexed value approach for priority determination	Panja, S.; Podder, A.; Chakrabarty, M.; Homechaudhuri, S.	Aquatic Ecology	2022	10.1007/s10452-022-09973-7	4	Therefore, this study aims to provide detailed indexing of conservation values for the freshwater fish species inhabiting the sub-Himalayan Terai-Dooars ecoregion of the Eastern Himalayas. Based on three years of extended sampling in six freshwater reaches, 170 indigenous fish species were identified.
1	Expanding narratives of governance constraints to improve coral reef conservation	Turner, R.A.; Forster, J.; Fitzsimmons, C.; Mahon, R.	Conservation Biology	2022	10.1111/cobi.13933	4	To understand and address the failures of reef governance, it is critical to understand the perceptions of diverse policy makers and practitioners about the challenges they face in achieving their goals. Examining the discourse of policy makers and practitioners can reveal the extent to which these perceptions capture the full spectrum of potential governance challenges, including those related to management, institutional structures and processes, the values and principles underpinning governance, and the social and environmental context. We conducted semistructured interviews with 110 policy makers and practitioners across multiple sectors, scales, and contexts in Barbados, St Kitts and Nevis, Belize, and Honduras.
1	Exploring the influence of social and informational networks on small farmers' responses to climate change in Oregon	Parks, M.	Agriculture and Human Values	2022	10.1007/s10460-022-10331-4	3	Drawing on assemblage theory and social network analysis in a novel way, this study explores the influence of Oregonian small farmers' social and informational networks on their beliefs about and responses to climate change. The U.S. Department of Agriculture (USDA) defines small farmers as those with a gross cash farm income between $1000 and $350,000 per year.
1	Agricultural Communities' Risk Assessment and the Effects of Climate Change: A Pathway Toward Green Productivity and Sustainable Development	Sohail, M.T.; Mustafa, S.; Ali, M.M.; Riaz, S.	Frontiers in Environmental Science	2022	10.3389/fenvs.2022.948016	3	This study was carried out to assess agricultural communities' understanding of climate change, the adaptation measures being undertaken against climate change, and industrial wastewater irrigation. It was considered important to check agricultural communities' understanding of climate change, as the majority of the study area belongs to the farming and industry sector.
1	Optimal Implementation of Climate Change Adaptation Measures to Ensure Long-term Sustainability on Large Irrigation Systems	Haro-Monteagudo, D.; Palazon, L.; Zoumides, C.; Begueria, S.	Water Resources Management	2022	10.1007/s11269-022-03225-x	4	This article describes a bottom-up-meets-top-down approach to estimate the optimal implementation intensity of adaptation strategies under different climate scenarios on a complex water resources system.
1	How local communities access, utilise and evaluate inland fisheries, and their influence on fishery conservation status in northern Zimbabwe	Utete, B.; Kupika, O.L.; Mahlatini, P.; Nyachowe, T.	Water Sa	2022	10.17159/wsa/2022.v48.i3.3885	4	This case study aimed to: (i) establish the use and perception of fisheries and ecosystem services by locals, (ii) undertake a monetary valuation of the fisheries, (iii) determine the potential threats to the fisheries, and (iv) examine the social drivers and barriers for citizen science involvement. Lastly, (v) we evaluated how the above factors affected the conservation of fisheries at Mushumbi Pools, Zimbabwe
6	From the ground up: Patterns and perceptions of herbaceous diversity in organic coffee agroecosystems	Archibald, S.; Allinne, C.; Cerdan, C.R.; Isaac, M.E.	Ecological Solutions and Evidence	2022	10.1002/2688-8319.12166	4	This study identifies the taxonomic and functional diversity of the herbaceous community in organic coffee agroforestry systems, and describes the extent of this diversity with farm, and farmer, attributes. We measured leaf-level functional traits (e.g. specific leaf area) of the herbaceous community to derive functional diversity indices and collected localized environmental conditions on 15 organic coffee farms in Central Valley, Costa Rica. We also conducted semi-structured interviews with nine farmers to construct mental models on herbaceous community management using a cognitive mapping approach
1	Whether They Return: Modeling Outdoor Recreation Behaviors, Decision Making, and Intention-to-Return in Congressionally Designated Wilderness	Ferguson, M.D.; Caraynoff, A.R.; Ferguson, L.A.; Barcelona, R.J.; Evensen, D.; Knox, H.; Pytlik, S.; Grosz, D.	Forests	2022	10.3390/f13071018	4	This study investigated the influence of social, situational, and ecological factors on outdoor recreation visitor behaviors and decision making within the Lye Brook Congressionally Designated Wilderness (LBW) area in Vermont, USA.
6	Climate Change-Between Myth and Truth in Romanian Farmers' Perception	Micu, M.M.; Dinu, T.A.; Fintineru, G.; Tudor, V.C.; Stoian, E.; Dumitru, E.A.; Stoicea, P.; Iorga, A.	Sustainability	2022	10.3390/su14148689	3	The study analyzes the awareness of the effects of climate change on agriculture and the measures that should be implemented in this regard from the farmer's perspective, taking into account the financial and promotional measures supported by the European Union for farmers. Thus, the study tracks the level of openness of farmers to implementing the measures that European policy makers will take in the coming period. Taking into account the fact that agriculture plays a particularly important economic role, due to the share of agricultural products in Romania's total exports, particularly in plant production, a quantitative survey was carried out among Romanian farmers, using a questionnaire as an instrument, with a total of 407 respondents.
1	Perspectives of Farmers on the Decline in Pinus pinea Nut Yield and the Sustainability of the Production: A Case Study in Kozak Basin in Western Turkey	Ozden, S.; Okan, T.; Bugday, S.E.; Kose, C.	Agriculture-Basel	2022	10.3390/agriculture12071070	3	In the Kozak Basin, which is the most important pine nut production and trade center in Turkey, there has been a significant decrease in production recently. In this study, the perspectives of the farmers in this area were investigated, specifically about reasons for the decrease in yields. For this purpose, a face-to-face survey was conducted with 378 pine nut farmers from the Kozak Basin
1	Assessing Barriers in Adaptation of Water Management Innovations under Rotational Canal Water Distribution System	Sajid, I.; Tischbein, B.; Borgemeister, C.; Florke, M.	Agriculture-Basel	2022	10.3390/agriculture12070913	4	This study assessed problems associated with irrigation water provisions and the potential barriers to the adaptation of the interventions (soil moisture sensors, on-farm water storage facilities and the drip method) under rotational canal water distribution in Punjab, Pakistan.
1	Vulnerability of Maize Farming Systems to Climate Change: Farmers' Opinions Differ about the Relevance of Adaptation Strategies	Albert, M.; Bergez, J.E.; Willaume, M.; Couture, S.	Sustainability	2022	10.3390/su14148275	3	This study focused on eliciting and understanding criteria that maize growers use to assess the vulnerability of their farming systems to climate change.
1	Achieving Transformative Change in Food Consumption in Austria: A Survey on Opportunities and Obstacles	Haider, V.; Essl, F.; Zulka, K.P.; Schindler, S.	Sustainability	2022	10.3390/su14148685	4	Here, we used an online survey targeting consumers in Austria to identify opportunities and barriers for consuming more sustainably.
1	Are We Vulnerable? Climate Risk Perception and Vulnerability of Small and Medium Size Agricultural Enterprises in China	Ye, W.; Li, M.C.	Asr Chiang Mai University Journal of Social Sciences and Humanities	2022	10.12982/CMUJASR.2022.006	3	Through literature review, the research proposes a measurement method for climate risk perception and perceived vulnerability of corporate management, constructs their influencing factors index system, and employs an online questionnaire to collect data for quantitative analysis. The study finds influencing factors of climate risk perception of managers include individual education level, environmental values, environmental concern, enterprise operation capability, and exposure to media.
1	The impact of alternative energy technology investment on environment and food security in northern Ethiopia	Tofu, D.A.; Wolka, K.; Woldeamanuel, T.	Scientific Reports	2022	10.1038/s41598-022-14521-2	4	Objective of this study was to investigate the domestic energy sources for households and the impact of biomass use as a source of energy on the environment and food insecurity in the drought-affected northern highlands of Ethiopia.
1	An Empirical Investigation of Farmers' Awareness and Behavior in the Sense of Water Scarcity Toward Participatory Management	Gazal, O.; Eslamian, S.	Iranian Journal of Science and Technology-Transactions of Civil Engineering	2022	10.1007/s40996-022-00894-x	4	In this study, the emphasis will be on the necessity of integrated participatory management, through Jordan as an example where groundwater over-exploitation has been on the increase with the presence of perennial severe water shortages, compounded by drought conditions, fluxes of refugee and agricultural activities expansion.
1	Livelihood resilience and global environmental change: toward integration of objective and subjective approaches of analysis	Quandt, A.; Paderes, P.	Geographical Review	2022	10.1080/00167428.2022.2085104	4	To address these issues, in this paper we explore the contributions of geographers to this research, critique top-down objective measurements of resilience, highlight the benefits of employing subjective conceptualizations of resilience, and outline methods for measuring subjective resilience with participatory methods.

1	Response to Water Scarcity: Gender Analysis of the Motivation Factors Toward Water Conservation Behavior in the Workplace	Palamuleni, L.G.; du Plessis, Y.; Bakuwa, R.C.	Frontiers in Water	2022	10.3389/frwa.2022.930681	4	The study adopted a quantitative research approach and was underpinned by a positivist research paradigm. Data were collected from 72 managers at North West University-Mahikeng (NWU-Mahikeng), South Africa using an online self-administered survey questionnaire. This study evaluates the factors related to predictors of water-conservation motivation behavior at work.
1	Advances in the Application and Utility of Subseasonal-to-Seasonal Predictions	White, C.J.; Domeisen, D.I.V.; Acharya, N.; Adefisan, E.A.; Anderson, M.L.; Aura, S.; Balogun, A.A.; Bertram, D.; Bluhm, S.; Brayshaw, D.J.; Browell, J.; Bueler, D.; Charlton-Perez, A; Chourio, X.; Christel, I.; Coelho, C.A.S.; DeFlorio, M.J.; Delle Monache, L.; Di Giuseppe, F.; Garcia-Solorzano, A.M.; Gibson, P.B.; Goddard, L.; Romero, C.G.; Graham, R.J.; Graham, R.M.; Grams, C.M.; Halford, A.; Huang, W.T.K.; Jensen, K.; Kilavi, M.; Lawal, K.A.; Lee, R.W.; MacLeod, D.; Manrique-Sunen, A.; Martins, E.S.P.R.; Maxwell, C.J.; Merryfield, W.J.; Munoz, A.G.; Olaniyan, E; Otieno, G; Oyedepo, J.A.; Palma, L; Pechlivanidis, I.G.; Pons, D; Ralph, F.M.; Reis, D.S.; Remenyi, T.A.; Risbey, J.S.; Robertson, D.J.C.; Robertson, A.W.; Smith, S.; Soret, A.; Sun, T; Todd, M.C.; Tozer, C.R.; Vasconcelos, F.C.; Vigo, I; Waliser, D.E.; Wetterhall, F.; Wilson, R.G.	Bulletin of the American Meteorological Society	2022	10.1175/BAMS-D-20-0224.1	4	To address this gap, here we present the first global community effort at summarizing relevant applications of S2S forecasts to guide further decision-making and support the continued development of S2S forecasts and related services. Focusing on 12 sectoral case studies spanning public health, agriculture, water resource management, renewable energy and utilities, and emergency management and response, we draw on recent advancements to explore their application and utility.
1	Foresighting future oceans: Considerations and opportunities	Kelly, R.; Foley, P.; Stephenson, R.L.; Hobday, A.J.; Pecl, G.T.; Boschetti, F.; Cvitanovic, C.; Fleming, A.; Fulton, E.A.; Nash, K.L.; Neis, B.; Singh, G.G.; van Putten, E.I.	Marine Policy	2022	10.1016/j.marpol.2022.105021	4	This paper contributes to emerging dialogue on the need to co-create visions of ocean futures, with a focus on the concept of foresighting. Foresighting is a process of creatively identifying possible, plausible, alternative socioecological futures in the medium to long term, and is increasingly seen as an approach that can support decision-making under uncertainty about the future. Here, we explore the origins and practical applications of foresighting from across the literature, before focusing on its (potential) application in the marine context.
1	Actor-network theory and organizational resilience to climate change in community-based tourism	Deason, G.; Seekamp, E.; Barbieri, C.	Journal of Outdoor Recreation and Tourism-Research Planning and Management	2022	10.1016/j.jort.2021.100483	4	We apply Actor Network Theory (ANT) in our study of an indigenous, community-based ecotourism organization in southern Mexico to understand its resilience to climate change.
1	Livelihood Capital Effects on Famers' Strategy Choices in Flood-Prone Areas-A Study in Rural China	Ao, Y.B.; Tan, L.; Feng, Q.Q.; Tan, L.Y.; Li, H.F.; Wang, Y.; Wang, T; Chen, Y.F.	International Journal of Environmental Research and Public Health	2022	10.3390/ijerph19127535	4	Following the sustainable development analysis framework proposed by the Department for International Development (DFID), this study collects empirical data of 360 rural households in six sample villages in the Jialing River Basin of Sichuan Province, China through a village-to-household field questionnaire and applies the Multinominal Logit Model (MNL) to explore the influence of farmer households' capital on livelihood strategy choice.
1	Weather index insurance in South Africa: An integrated approach to farmers' willingness-to-pay intentions	Mathithibane, M.S.; Chummun, B.Z.	African Review of Economics and Finance-Aref	2022		4	The paper assesses potential demand for index-based insurance among maize farmers through a hypothetical market scenario, investigating willingness-to-pay and prevalent factors influencing the decision-making process.
1	Empowering the Voiceless: Securing the Participation of Marginalised Groups in Climate Change Governance in South Africa	Sibiya, N.; Sithole, M.; Mudau, L; Simatele, M.D.	Sustainability	2022	10.3390/su14127111	4	We examine the myriad ways in which climate change adaptation policies and strategies are developed, and we systematically discuss the factors which either facilitate or hamper the involvement of all stakeholders in the development of these intervention measures.
1	Disaster risk management: Focused to flood hazard and its impact in Pakistan	Manzoor, A.S.; Wajidi, A.; Wagan, S.A.; Riaz, S.; Siddique, M.	Global Nest Journal	2022	10.30955/gnj.004223	4	This paper focuses on some of the key benefits that may be achieved in presence of a proper disaster management framework or policies and also it proposes latest technologies to deal with hazards.This paper also demonstrates a simple concept that may be adopted and implemented immediately, that may help to minimize the impact economically, socially and environmentally.
1	A holistic modeling framework for estimating the influence of climate change on indoor air quality	Salthammer, T.; Zhao, J.Y.; Schieweck, A.; Uhde, E.; Hussein, T.; Antretter, F.; Kunzel, H.; Pazold, M.; Radon, J.; Birmili, W.	Indoor Air	2022	10.1111/ina.13039	4	To increase awareness for this topic, the Indoor Air Quality Climate Change (IAQCC) model system was developed, which allows short and long-term predictions of the indoor climate with respect to outdoor conditions. The IAQCC is a holistic model that combines different scenarios in the form of submodels: building physics, indoor emissions, chemical-physical reaction and transformation, mold growth, and indoor exposure
1	Envisioning the Indigenised university for sustainable development	Mbah, M.F.; Ajaps, S.; Johnson, A.T.; Yaffa, S.	International Journal of Sustainability in Higher Education	2022	10.1108/IJSHE-09-2021-0413	4	Therefore, this paper aims to identify the nature and outcomes of the university's engagement with Indigenous communities and perceptions of Indigenous knowledge systems in both academic and non-academic activities, and what might be required to foster the university's contributions towards sustainable development.
1	Tick ecology and Lyme borreliosis prevention: a regional survey of pharmacists' knowledge in Auvergne-Rhone-Alpes, France	Bord, S.; Dernat, S.; Ouillon, L.; Rene-Martellet, M.; Vourc'h, G.; Lesens, O.; Forestier, C.; Lebert, I.	Ticks and Tick-Borne Diseases	2022	10.1016/j.ttbdis.2022.101932	4	The objective of this study was to assess pharmacy professionals' knowledge about both tick ecology and the appropriate measures for tick bites and Lyme borreliosis prevention. It was based on an online survey of 364 pharmacists and pharmacy assistants located in the Auvergne-Rhone-Alpes region of France.

1	Scientific agriculture and the chimera of racialization in modernity: a global genealogy and a subtropical perception	da Silva, C.M.	Historia Unisinos	2022	10.4013/hist.2022.262.01	4	Based on this debate, I propose a historical genealogy focusing on the foundations of violence in agricultural practices against humans and non-humans, as a way to argue that, besides latifundia and slavery, other global historical events interfered in the production of a racialized, hierarchical, and violent agricultural paradigm.
1	A Study on the Level of Risk Taking and Willingness of Pastoralists to Use Rangeland Insurance in the North of Iran	Yeganeh, H.; Pournemati, A.; Zamani, M.; Farsi, R.; Biswas, A.	Rangeland Ecology & Management	2022	10.1016/j.rama.2022.01.007	4	Pastoralists inhabiting the rangeland of northern Iran are threatened by dangers like drought, cold, floods, livestock diseases, and livestock price fluctuations. Insurance offers them a promising mechanism to manage their activities. However, information on the willingness of pastoralists to take the risk or accept insurance remains unknown. To answer this question, a cross-sectional survey was conducted among pastoralists in the Kiasar rangelands from the north of Iran; 65 pastoralists were selected from a total of 200 pastoralists of the area. D
1	Drought perception and field-level adaptation strategies of farming households in drought-prone areas of Afghanistan	Aliyar, Q.; Zulfiqar, F.; Datta, A.; Kuwornu, J.K.M.; Shrestha, S.	International Journal of Disaster Risk Reduction	2022	10.1016/j.ijdrr.2022.102862	3	Therefore, this research was carried out to assess farmers' perceptions of climate change and droughts, drought severity, impact of droughts on crop productivity, and farmers' adaptation strategies to buffer the effect of drought using primary data collected through farmer survey, and climate change analysis using the secondary data. Finally, farmers' perceptions of climate and drought were compared with meteorological data using data from both primary and secondary sources. The primary data were gathered using a pretested and structured questionnaire from 120 sampled farmers in the rainfed and irrigated areas of Bamyan Province of Afghanistan.
1	Using cognition and risk to explain the intention-behavior gap on bioenergy production: Based on machine learning logistic regression method	He, K.; Ye, L.H.; Li, F.L.E.; Chang, H.Y.; Wang, A.B.; Luo, S.X.; Zhang, J.B.	Energy Economics	2022	10.1016/j.eneco.2022.105885	4	Based on the machine learning logistic regression method, taking biogas produced by swine manure as an example, we explore the role of cognition and risk in bridging the intention-behavior gap in bioenergy production. Unlike previous studies, we find that for bioenergy production, a pro-environmental behavior with positive externalities, an individual's perception of environmental policy plays a better role in driving the intention-to-behavior transition than the individual's perception of bioenergy production.
1	Impacts of payment for forest environmental service policy in Vietnam: A case study of Muong Nhe protected area	Truong, D.D.; Dat, T.T.; Hang, N.D.; Huan, L.H.	Trees Forests and People	2022	10.1016/j.tfp.2022.100198	4	Payment for Forest Environmental Services (PFES) is an innovation policy in forest resource management in Vietnam since it was applied in 2011 nationwide. This paper is a case study assessing the impact of PFES policy in Muong Nhe Protected Area (MNPA), Dien Bien Province. The study surveyed 350 households in MNPA buffer zone communes combined with in-depth interviews with key informants. The results show that the impacts of PFES policy on local communities are very large, contributing to increasing incomes for local ethnic minorities, eradicating poverty, promoting sustainable forest management and protection, raising people's awareness about forest conservation, and contributing to the construction of local public facilities.
1	Understanding scientists' communication challenges at the intersection of climate and agriculture	Getson, J.M.; Church, S.P.; Radulski, B.G.; Sjostrand, A.E.; Lu, J.Y.; Prokopy, L.S.	Plos One	2022	10.1371/journal.pone.0269927	4	Due to the polarization of climate change issues and the concurrent need for agricultural adaptation, we sought to examine how scientists communicate in this sector. A survey, administered to climate scientists and pertinent U.S. federal agency staff (response rate = 43%), was conducted to examine perspectives on communicating with five agricultural stakeholder groups: agribusinesses, crop advisors, general public, producers, and policymakers.
1	An Assessment of Key Factors Affecting Farm Households' Livelihood Diversification Strategies Using a Novel Approach of Multivariate Probit: A Case of Rural Vietnam	Lan, N.T.H.; Fahad, S.; Tuan, N.A.; Nguyen, T.T.; Huyen, N.T.; Dung, N.T.T.; Huong, N.T.L.	Indian Journal of Economics and Development	2022	10.35716/IJED/22010	4	This study investigated the various factors influencing farm households' livelihood strategies and livelihood diversity that resided in the northern mountainous region of Vietnam.
1	Farmers' Cultural Biases and Adaptation Behavior towards Drought: A Case in Sistan Plain	Karimi, H.; Ataei, P.	Journal of Agricultural Science and Technology	2022		4	The present study aimed to investigate farmers' drought adaptation behavior and the effect of cultural biases on it among farmers in the Sistan Plain, Iran.
1	Farmers' Perceptions of Climate Change Risk: Comparing the Accuracy of Farmers' Perceptions with Meteorological Data in Kermanshah Township	Aliabadi, S,G,; Agahi, H,; Farhadian, H,	Journal of Agricultural Science and Technology	2022		3	Research sample included 217 farmers of Kermanshah Township, who were selected using multistage sampling technique.
1	Agriculture 4.0 - Concepts, technologies and Prospects	Beluhova-Uzunova, R.; Dunchev, D.	Scientific Papers-Series Management Economic Engineering in Agriculture and Rural Development	2022		4	In this context, the aim of the paper is to outline the main definitions, concepts, technologies and trends in Agriculture 4.0 development and discuss the challenges, as well as opportunities and prospects.
23	Eco-anxiety in children: A scoping review of the mental health impacts of the awareness of climate change	Léger-Goodes, T.; Malboeuf-Hurtubise, C.; Mastine, T.; Généreux, M.; Paradis, P-O.; Camden, C.	Frontiers in Psychology	2022	10.3389/fpsyg.2022.872544	4	The aim of this review was to: (1) identify the available evidence on the topic of eco-anxiety in children, (2) clarify the mental health consequences brought by the awareness of climate change in this population, and (3) identify knowledge gaps in the literature and considerations for future research.
3	An integrated evaluation of mangrove health and ecosystem value to local inhabitants: a blended ecological and sociological approach	Dayal, S.; Waqa-Sakiti, H.; Tabe, T.; Hodge, S.	Macmillan Brown Centre for Pacific Studies	2022	10.26021/12508	4	This study comprised detailed botanical and soil analyses of the Nasilai River mangrove forests in the Rewa region of Viti Levu, the largest Fijian island.
3	Determinants of adoption of climate-smart agricultural technologies and practices in the coffee-based farming system of Ethiopia	Diro, S.; Tesfaye, A.; Erko, B.	Agriculture & Food Security volume	2022	10.1186/s40066-022-00385-2	4	This study explored the adoption status of different Climate Smart Agricultural (CSA) practices and factors that influence their adoption for sustainable soil resource utilization in the changing climate.
16	Environmental Stewardship: Confluence of Law and Religion?	Venter, F.	Potchefstroom Electronic Law Journal/Potchefstroomse Elektroniese Regsblad	2022	10.17159/1727-3781/2022/v25ia13879	4	The analysis leads to the notion of stewardship, a concept steeped in, but not exclusive to religion in its diverse manifestations. Examples of ecocentric religious attitudes – ranging from the traditions of the North American Anishinabek, aboriginal Australians and indigenous African culture to Buddhism and Hinduism, Judaism and Christianity in its principal manifestations – provide a broad picture of adherence to beliefs in human responsibility to take care of the environment.
3	Advances in Hass avocado irrigation scheduling under digital agriculture approach ; Avances en la programación del riego de aguacate Hass bajo un enfoque de agricultura digital	Erazo-Mesa, E.; Echeverri-Sánchez, A.; Ramírez-Gil, J. G.	Revista Colombiana de Ciencias Hortícolas	2022	10.17584/rcch.2022v16i1.13456	4	Here, we present a mixture of well-known studies in the Hass avocado irrigation focused on proximal sensing (PS) technologies and recent studies emphasizing the potential of remote sensing (RS), and application technologies to schedule the irrigation.
19	Commercial cash crop production and households' economic welfare: Evidence from the pulse farmers in rural China1	Ji-liang, M.A.; Fan, L.I., Hui-jie, Zhang; Nawab, K.	Journal of Integrative Agriculture	2022	10.1016/j.jia.2022.09.006	4	This study first investigated the determinants of household behavior in commercial pulse farming. It then examined how households' commercial pulse production improves their economic welfare.

19	Uncertainty, anxiety, and optimism: Diverse perspectives of rainbow and steelhead trout fisheries governance in British Columbia	Kadykalo, A.N.; Jeanson, A.L.; Cooke, S.J.; Young, N.	Environmental Challenges	2022	10.1016/j.envc.2022.100610	4	We examine the perceptions of stakeholders, Indigenous rightsholders, and regulatory/governance groups on the current and future status of Oncorhynchus mykiss (including their resident form – rainbow trout – and their anadromous form – steelhead) populations and fisheries in British Columbia (BC), Canada from 65 qualitative interviews and 1029 quantitative survey responses.
2	High emissions could increase the future risk of maize drought in China by 60–70 %	Jia, H.; Chen, F.; Zhang, C.; Dong, J.; Du, E.; Wang, L.	Science of the Total Environment	2022	10.1016/j.scitotenv.2022.158474	4	Intercomparison of the three Shared Socio-economic Pathway (SSP) scenarios based drought risks and yield loss of China was carried out using the climate models from the Coupled Model Intercomparison Project Phase 6 (CMIP6), and the hotspots of high drought risk regions were identified.
2	A multi-criteria decision analysis model for ship biofouling management in the Baltic Sea	Luoma, E.; Laurila-Pant, M.; Altarriba, E.; Nevalainen, L.; Helle, I.; Granhag, L.; Lehtiniemi, M.; Srėbalienė, G.; Olenin, S.; Lehikoinen, A.	Science of the Total Environment	2022	10.1016/j.scitotenv.2022.158316	4	Applying Bayesian networks, we developed a multi-criteria decision analysis model to compare biofouling management strategies in the Baltic Sea, given the characteristics of a ship, its operating profile and operational environment, considering the comprehensive environmental impact and the monetary costs.
6	Managed culls mean extinction for a marine mammal population when combined with extreme climate impacts	Davis, K.J.	Ecological Modelling	2022	10.1016/j.ecolmodel.2022.110122	4	Here, I develop stochastic matrix population models of the South American sea lion (Otaria flavescens) parameterised through a combination of species-specific field data and phylogenetic imputation using data from related species in the COMADRE animal matrix database.
6	A governance perspective for climate change adaptation: Conceptualizing the policy-community interface in Bangladesh	Hossen, M.A; Netherton, C.; Benson, D.; Rahman, M.R.; Salehin, M.	Environmental Science and Policy	2022	10.1016/j.envsci.2022.08.028	4	The lesser the gap between government policy and the local community's needs for adaptation the more effective outcomes are for ensuring policy success and promoting sustainable community livelihoods or vice versa. This interface between policy and community is important for climate change adaptation which is explored in this paper along with the findings of the research project, DEltas, vulnerability and climate change: Migration and Adaptation (DECCMA) conducted during 2014–2018 in Bangladesh, Ghana, India, and the United Kingdom.
6	Climate change in the Catalan Pyrenees intersects with socioeconomic factors to shape crop diversity and management	Blanch-Ramirez, J.; Calvet-Mir, L.; Aceituno-Mata, L.; Benyei, P.	Agronomy for Sustainable Development	2022	10.1007/s13593-022-00806-3	3	To fill this gap, we conducted 24 semi-structured interviews in a study site located in the Catalan Pyrenees. Our results show for the first time in an industrialized context that farmers perceive multiple interrelated climate change impacts on local agroecosystems.
6	Gendered perception of change in prevalence of pests and management in Zimbabwe smallholder irrigation schemes	Mwadzingeni, L.; Mugandani, R.; Mafongoya, P.L.	Agronomy for Sustainable Development	2022	10.1007/s13593-022-00814-3	4	This study is the first one to assess gendered perceptions on the change in prevalence and management of pests in Exchange, Insukamini, and Ruchanyu irrigation schemes in Zimbabwe.
2	Exploring the motivational roots of farmers' adaptation to climate change-induced water stress through incentives or norms	Zobeidi, T.; Yaghoubi, J.; Yazdanpanah, M.	Scientific reports	2022	10.1038/s41598-022-19384-1	4	The aim of the current study is to consider farmers' perceptions regarding the impacts of climate change on water resources and their intention toward adaptation in southwestern Iran.
6	Delivering global water security: Embedding water justice as a response to increased irrigation efficiency	Owens, K.; Carmody, E.; Grafton, Q.; O'Donnell, E.; Wheeler, S.; Godden, L.; Allen, R.; Lyster, R.; Steduto, P.; Jiang, Q.; Kingsford, R.; Quiggin, J.	Wiley Interdisciplinary Reviews: Water	2022	10.1002/wat2.1608	4	In this article, we critique current approaches to governing irrigation efficiency, using a water justice lens to identify four key insights and their implications for governance.
2	Living Customary Water Tenure in Rights-based Water Management in Sub-Saharan Africa	van Koppen, B.	IWMI Research Report	2022	10.5337/2022.214	4	Based on literature, this report aims to fill the knowledge gap pertaining to both water resources (as addressed in water law) and infrastructure development (key to access sufficient water when and where needed) by developing a grounded understanding of customary water tenure, with the rural farming or pastoralist community as the unit of analysis.
1	Urban nullius? Urban Indigenous People and Climate Change	Nursey-Bray, M.; Parsons, M.; Gienger, A.	Sustainability	2022	10.3390/su141710830	6	Our aim was to identify scholarship that discussed how Indigenous people are affected by climate change in cities.
6	The Assessment of Future Air Temperature and Rainfall Changes Based on the Statistical Downscaling Model (SDSM): The Case of the Wartburg Community in KZN Midlands, South Africa	Ncoyini-Manciya, Z.; Savage, M.J.	Sustainability	2022	10.3390/su141710682	4	The study intends to analyse historical climate (air temperature and rainfall) data from a weather station that has not been employed for climate change studies and project possible future changes in the same climate parameters due to global warming for a localised agricultural community within the sugarbelt region of KwaZulu-Natal, South Africa.
1	Priming for individual energy efficiency action crowds out support for national climate change policy	Knook, J.; Dorner, Z.; Stahlmann-Brown, P.	Ecological Economics	2022	10.1016/j.ecolecon.2021.107239	4	This study analyses crowding out between the uptake of low-cost actions and the support for national climate change policy in the agricultural sector.
1	The determinants of adapting forest management practices to climate change: Lessons from a survey of French private forest owners	Thomas, J.; Brunette, M.; Leblois, A.	Forest Policy and Economics	2022	10.1016/j.forpol.2021.102662	3	This article proposes to deepen our understanding of the decision-making process of private forest owners in terms of adaptation decisions towards climate change. In particular, we question whether or not French private forest owners have already implemented adaptation strategies and if yes, we identify the determinants of this decision.
1	Response to climate change in a rain-fed crop production system: insights from maize farmers of western Kenya	Kogo, B.K.; Kumar, L.; Koech, R.; Hasan, M.K.	Mitigation and Adaptation Strategies for Global Change	2022	10.1007/s11027-022-10023-8	4	The purpose of this study was to examine farm-level adaptation responses towards climate change and their influencing factors, using a case study of western Kenya.
10	Indigenous Perceptions of Factors Influencing Behavioral Intentions Towards Climate Change Mitigation: An Assessment	Basiru, I.; Liu, G.J.; Arkorful, V.E.; Lugu, B.K.; Yousaf, B.; Hussain, M.; Jama, O.M.	International Journal of Public Administration	2022	10.1080/01900692.2022.2078838	4	In this study, an attempt is made to understand the behavioral intentions towards climate change mitigation using Ajzen's framework of the Theory of Planned Behavior. It examines the factors that influence mitigation behavioral intentions among local people in Ghana.
1	Global health impact of atmospheric mercury emissions from artisanal and small-scale gold mining	Pang, Q.T.; Gu, J.; Wang, H.K.; Zhang, Y.X.	Iscience	2022	10.1016/j.isci.2022.104881	4	Past research has focused on the health impacts on miners and nearby residents; here, we estimate the risk for global general populations by employing a comprehensive atmosphere-land-ocean-ecosystem and exposure-risk-valuation model framework.
1	Exploring wildlife disservices and conservation in the context of ecosystem-based adaptation: A case study in the Mt. Elgon region, Uganda	Christianson, A.B.; Montgomery, R.; Fleischman, F.; Nelson, K.C.	Ecosystem Services	2022	10.1016/j.ecoser.2022.101465	4	This case study applies the Common International Classification of Ecosystem Services framework to examine an ecosystem-based adaptation program in the Mt. Elgon region of Uganda.
1	State of ambient air quality in a low-income urban settlement of South Africa	Matandirotya, N.R.; Moletsane, S.D.; Matandirotya, E.; Burger, R.P.	Scientific African	2022	10.1016/j.sciaf.2022.e01201	4	The purpose of the study was to investigate the quality of ambient air in a low-income urban settlement of Jabavu located within the City of Johannesburg during the year 2018. Air pollution and meteorological data were gathered from the South African Air Quality System network. The study focused on three pollutants namely PM10, SO2 and O3.
1	Coastal Vulnerability Assessment of Bali Province, Indonesia Using Remote Sensing and GIS Approaches	Hastuti, A.W.; Nagai, M.; Suniada, K.I.	Remote Sensing	2022	10.3390/rs14174409	4	Therefore, the main objective of this research is to identify how vulnerable the coastal zone of Bali Province by develop a Coastal Vulnerability Index (CVI) of areas exposed to the sea-level rise on regional scales using remote sensing and Geographic Information System (GIS) approaches.

1	Do We Really Have to Scale Up Local Approaches? A Reflection on Scalability, Based upon a Territorial Prospective at the Burkina Faso-Togo Border	Ancey, V.; Sourisseau, J.M.; Corniaux, C.	Sustainability	2022	10.3390/su141710977	4	We challenge this norm in the field of agricultural development, where it has recently become widespread, offering a critique and alternative approaches by presenting work conducted on the border between Burkina Faso and Togo.
1	Replacing rice with lower water consumption crops: green policy implications for Iran	Yazdanpanah, M.; Zobeidi, T.; Sieber, S.; Lohr, K.; Homayoon, S.B.	Climate Research	2022	10.3354/cr01700	4	This study used the extended theory of planned behavior (TPB) to predict rice growers' intentions to alter their current rice cropping system to other, less water-consumptive products.
1	Antioxidant activity and the physicochemical composition of young caper shoots (Capparis spinosa L.) of different Spanish cultivars	Grimalt, M.; Hernandez, F.; Legua, P.; Amoros, A.; Almansa, M.S.	Scientia Horticulturae	2022	10.1016/j.scienta.2021.110646	4	The present investigation tries to raise awareness of the nutritional value of this aerial part of the caper plant and promote higher levels of consumption of this specific part, by means of the study of different cultivars located in different geographic zones.
1	Public perceptions of blue carbon in South Korea: Findings from a choice experiment	Kim, J.H.; Nam, J.; Yoo, S.H.	Marine Policy	2022	10.1016/j.marpol.2022.105236	4	This article strives to assess the economic value of blue carbon judged by the public by the use of a choice experiment (CE).
1	Pastoral practices, pressures, and human-wildlife relations in high altitude rangelands of eastern Himalaya: A case study of the Dokpa pastoralists of North Sikkim	Luxom, N.M.; Singh, R.; Theengh, L.; Shrestha, P.; Sharma, R.K.	Pastoralism-Research Policy And Practice	2022	10.1186/s13570-022-00252-6	4	Against the backdrop of these changes, this study aims to understand the current state of pastoralism in North Sikkim with three specific objectives: (i) to understand the current rangeland management practices of the Dokpa community; (ii) to examine the social, political and ecological stresses to continuity of traditional pastoral livelihoods; and (iii) to document the baseline on human-wildlife relations.
1	Population, behavior and conservation status of the northern pig-tailed macaque (Macaca leonina) in the Inner-line reserve forest, Assam, India	Singh, B.; Rahman, A.; Talukdar, N.R.; Choudhury, P.	Tropical Ecology	2022	10.1007/s42965-022-00276-4	4	We studied the activity profile of the species following a focal female individual of a selected troop and have obtained information on the anthropogenic threats and other conservation issues in the forest.
1	Small Island Developing States and climate securitisation in international politics: Towards a comprehensive conception	Rasheed, A.A.	Island Studies Journal	2022	10.24043/isj.391	4	This article focuses on the engagement of Small Island Developing States (SIDS) in the climate security debate launched by the United Nations Security Council. It aims to show how SIDS' engagement in the Security Council debate can provide an innovative approach to explain and overcome some of the conceptual and policy challenges for climate securitisation at the international level.
6	The role of education in biodiversity conservation: Can knowledge and understanding alter locals' views and attitudes towards ecosystem services?	Borresen, S.T.; Ulimboka, R.; Nyahongo, J.; Ranke, P.S.; Skjaervo, G.R.; Roskaft, E.	Environmental Education Research	2022	10.1080/13504622.2022.2117796	4	In this study, we tested how student knowledge, attitudes and views towards ecosystem services and biodiversity changed due to an education programme. We assessed the before and after knowledge, attitudes, and views of 180 level-two secondary school students in the Ngorongoro District, Tanzania.
1	Do youth conceptualizations influence the inclusion of young people in sustainable agriculture intensification? Insights from Ghana and Malawi	Zulu, L.C.; Djenontin, I.N.S.; Kamoto, J.F.; Kampanje-Phiri, J.M.; Fischer, G.	Environment Development And Sustainability	2022	10.1007/s10668-022-02632-9	4	We examine local conceptualizations and definitions of the youth and how they influence youth inclusion in sustainable agriculture intensification (SAI) in Ghana and Malawi amidst challenges of high youth unemployment and underemployment, food insecurity, and rural out-migration.
1	Going Underwater? Flood Risk Belief Heterogeneity and Coastal Home Price Dynamics	Bakkensen, L.A.; Barrage, L.	Review of Financial Studies	2022	10.1093/rfs/hhab122	3	How do climate risk beliefs affect coastal housing markets? This paper provides theoretical and empirical evidence.
1	Agribusiness and environmental conservation in tropical forests in the eastern Amazon	Pinheiro, C.D.D.; Silva, L.C.; Matlaba, V.J.; Giannini, T.C.	Sustainable Production And Consumption	2022	10.1016/j.spc.2022.08.015	4	The objective of this study was to analyze the agribusiness practices adopted by cooperatives and associations of farmers in Pará state (Eastern Amazon, Brazil) and the importance they attribute to environmental conservation.
1	Perceptions of plastic pollution in a prominent fishery: Building strategies to inform management	Wootton, N.; Nursey-Bray, M.; Reis-Santos, P.; Gillanders, B.M.	Marine Policy	2022	10.1016/j.marpol.2021.104846	4	Using the South Australian Marine Scalefish Fishery as a case study, we uncover levels of awareness, knowledge and concern, as well as impacts and potential solutions of marine plastic pollution from commercial and recreational fishers and fishmongers.
1	New path creation in energy transition: Exploring the interplay between resource formation and social acceptance of biomass adoption in Europe	Panori, A.; Kostopoulos, I.; Karampinis, E.; Altsitsiadis, A.	Energy Research & Social Science	2022	10.1016/j.erss.2021.102400	4	The study focuses on the use of agricultural biomass (or "agrobiomass") as a renewable energy source for heating and tries to investigate the interaction between resource formation processes during path creation, referring to knowledge creation, market formation, investment mobilization and technology legitimation, and social acceptance.
1	Natural and Indigenous sciences: reflections on an attempt to collaborate	Kater, I.	Regional Environmental Change	2022	10.1007/s10113-022-01967-3	4	The purpose of this essay is two-fold. The first is to signpost natural scientists wishing to engage in collaborative research towards key texts and concepts that could aid their work. It is not an extensive review, but rather what is hopefully an accessible introduction. It is, quite simply, an essay that the author would have appreciated having access to before undertaking her work. The second is to contribute to a wider discussion around the need for a more diverse and decolonial training in the natural sciences, so we all can respond to the many changes currently occurring on our planet using knowledge generated from well-informed, meaningful and effective collaborations.
1	The effect of proximity to protected areas on community adaptation to environmental change	Gillespie, J.; Penny, D.	Journal Of Environmental Management	2022	10.1016/j.jenvman.2021.113805	4	Here, we employ social science methods to explore the impact of an internationally significant protected area on adjacent communities in the Tonle Sap Lake basin, Cambodia.
1	Connecting to the oceans: supporting ocean literacy and public engagement	Kelly, R.; Evans, K.; Alexander, K.; Bettiol, S.; Corney, S.; Cullen-Knox, C.; Cvitanovic, C.; de Salas, K.; Emad, G.R.; Fullbrook, L.; Garcia, C.; Ison, S.; Ling, S.; Macleod, C.; Meyer, A.; Murray, L.; Murunga, M.; Nash, K.L.; Norris, K.; Oellermann, M.; Scott, J.; Stark, J.S.; Wood, G.; Pecl, G.T.	Reviews In Fish Biology And Fisheries	2022	10.1007/s11160-020-09625-9	4	We focus on four drivers that can influence and improve ocean literacy and societal connections to the ocean: (1) education, (2) cultural connections, (3) technological developments, and (4) knowledge exchange and science-policy interconnections. We explore how each driver plays a role in improving perceptions of the ocean to engender more widespread societal support for effective ocean management and conservation.
1	Weather variability and conflict forecasts: Dynamic human-environment interactions in Kenya	Linke, A.M.; Witmer, F.D.W.; O'Loughlin, J.	Political Geography	2022	10.1016/j.polgeo.2021.102489	4	While conflict prediction has gained considerable attention in recent years, the existing literature has relied mainly upon aggregated data for large administrative areas or even entire countries. Such approaches obscure significant geographic variation of conflict dynamics based on household and individual experiences. Conflicts are highly localized, shaped by social and economic contexts that vary across space and change throughout time. We predict two types of conflict reported by respondents in a 2018 Kenyan population survey (N = 1,400) using an identical survey carried out in 2014 in the same enumeration areas (sample locations).

6	Cumulative Energy Demand and Carbon Footprint of the Greenhouse Cultivation System	Grabarczyk, R.; Grabarczyk, S.	Applied Sciences-Basel	2022	10.3390/app12178786	4	The paper describes the influence of horticultural production in greenhouses under Polish climate conditions on energy consumption, contributing to greenhouse gas emissions and global warming.
1	Contextualisation of salinisation and adaptation preferences in the coastal areas of Bangladesh: Bringing together farmers' salinity perspectives into place-based policy initiatives	Islam, M.A.; de Bruyn, L.L.; Koech, R.; Warwick, N.	Land Degradation & Development	2022	10.1002/ldr.4431	4	The aim of this study was to examine co-located farmers' salinisation perspectives (e.g., trends, causes, impacts), and to demonstrate its potential for place-based policy initiatives and research prioritisation for sustainable agricultural development in the coastal areas.
1	Crucial role of Arabidopsis glutaredoxin S17 in heat stress response revealed by transcriptome analysis	Rao, X.L.; Cheng, N.H.; Mathew, I.E.; Hirschi, K.D.; Nakata, P.A.	Functional Plant Biology	2022	10.1071/FP22002	4	In this study, we extend our investigation into the effect of AtGRXS17 and heat stress on plant growth and development.
11	Perception on coastal erosion: An assessment of how national level coastal resilience strategies promote indigenous knowledge and affect local level adaptation in Ghanaian communities	Arkhurst, B.M.; Poku-Boansi, M.; Adarkwa, K.K.	Environmental Science & Policy	2022	10.1016/j.envsci.2022.08.019	4	Using an explorative qualitative case study of selected coastal communities in Ghana, the paper contributes to this gap by assessing how national level strategies impact adaptation to coastal erosion at the local level. It also examines the institutional and community perception of coastal erosion, its causes and impacts.
6	Effects of agricultural extension system on promoting conservation agriculture in Shaanxi Plain, China	Fan L.; Ge Y.; Niu H.	Journal of Cleaner Production	2022	10.1016/j.jclepro.2022.134896	4	This study conducted surveys on agricultural information channels accessed by farmers, the perception of farmers and AES workers regarding AES, as well as factors that influence the AES promoting farmers' CA adoption via 363 respondents (262 farmers and 101 AES workers) in the Shaanxi Plain in northern China.
2	Climate-friendly business: A study to assess its potential in the coastal areas of Bangladesh	Chowdhury M.A.; Tarin N.J.; Roy S.K.; Mahmood S.	Journal of Coastal Conservation	2022	10.1007/s11852-022-00914-y	4	Hence, the coastal areas need climate-friendly business plans to promote sustainable resource utilization while protecting the environment. Following the background, we conducted this study to understand the people's perception of the potential of climate-friendly business in the coastal areas of Bangladesh.
2	Integrating climate information into decision making for building resilience: A case study on farming communities in Bihar, India	Anshul A.; Mitesh S.; Srinivasan G.; Buizer J.; Finan T.; Singh K.K.; Kumar S.	Climate Services	2022	10.1016/j.cliser.2022.100328	4	The International Research and Applications Project (IRAP) was a research experiment aimed at improving the livelihoods of rural farmers in Bihar, India, by producing and providing them with tailored weather and climate information. Forecast Application for Risk Management in Agriculture (FARM) schools were conducted to improve the awareness of farmers about the need for climate information and climate adaptation interventions which was applied for Kharif crops in summer monsoon 2018.
6	Community perceptions of carbon farming: A case study of the semi-arid Mulga Lands in Queensland, Australia	Jassim D.; Witt B.; Evans M.C.	Journal of Rural Studies	2022	10.1016/j.jrurstud.2022.10.010	4	This research uses semi-structured interviews and qualitative analysis to explore community perceptions of carbon farming in the vast and remote Mulga Lands of Queensland, Australia, a region that supports nearly 200 carbon projects across 7 million hectares.
2	Risk assessment of harmful algal blooms (HAB) occurrence in the agroecosystem: A hydro-ecologic modeling framework and environmental risk matrix	Hou C.; Chu M.L.; Guzman J.A.	Ecological Indicators	2022	10.1016/j.ecolind.2022.109617	4	This paper was aimed at assessing the risk of HAB occurrence in a highly cultivated watershed and evaluating the effectiveness of N and P fertilizer reduction practices in mitigating this risk under future climate projections. To achieve this objective, a modelling framework was developed for HAB risk assessment under different environmental stressors including climate changes and different land management practices.
2	A national hydrological projections service for Australia	Wilson L.; Bende-Michl U.; Sharples W.; Vogel E.; Peter J.; Srikanthan S.; Khan Z.; Matic V.; Oke A.; Turner M.; Co Duong V.; Loh S.; Baron-Hay S.; Roussis J.; Kociuba G.; Hope P.; Dowdy A.; Donnelly C.; Argent R.; Thomas S.; Kitsios A.; Bellhouse J.	Climate Services	2022	10.1016/j.cliser.2022.100331	4	Information available for Australian hydrological impact assessments to date has been produced through state and territory based regional downscaling efforts, across limited timescales and using different interpretation methods, particularly regarding downscaling and assessing hydrological impacts. To address this need, the Australian Bureau of Meteorology has released an innovative, seamless national landscape water service called the Australian Water Outlook. This service provides historical data on water availability with forecast products, as well as hydrological impact projections, using the Bureau's operational Australian Water Landscape Water Balance model (AWRA-L).
11	Climate change perception and the adoption of innovation among mango plantation farmers in the Yilo Krobo municipality, Ghana	Asare-Nuamah P.; Antwi-Agyei P.; Dick-Sagoe C.; Adeosun O.T.	Environmental Development	2022	10.1016/j.envdev.2022.100761	4	Drawing on the protection motivation and the innovation diffusion theories, this study assesses the effect of climate change perceptions on the adoption of innovations among mango farmers in the Yilo Krobo Municipality, Ghana.
6	Factors Influencing the Feasibility, Effectiveness, and Sustainability of Farmers' Adaptation Strategies to Climate Change in The Indian Eastern Himalayan Foothills	Datta P.; Behera B.	Environmental Management	2022	10.1007/s00267-022-01724-6	4	Based on the primary data collected from 300 farming households of the Indian Eastern Himalayan foothills, the present study attempts to examine the efficiency of local farmers' adaptation by developing indices combining the feasibility, effectiveness, and sustainability of the adaptation measures with the scale of actual adoption. Further, by employing multiple linear regression, the study analyzes the internal (psychological) and external (physical and socio-economic) factors influencing higher scores of these indices.
2	Exploring lessons from five years of biochar-producing cookstoves in the Kagera region, Tanzania	Eltigani A.; Olsson A.; Krause A.; Ernest B.; Fridahl M.; Yanda P.; Hansson A.	Energy for Sustainable Development	2022	10.1016/j.esd.2022.09.015	4	The present study contributes to filling this knowledge gap, by identifying key factors affecting the level of stove adoption and use, as well as biochar utilization.
2	Climate-sensitive hydrological drought insurance for irrigated agriculture under deep uncertainty. Insightful results from the Cega River Basin in Spain	Agudo-Domínguez A.; Pérez-Blanco C.D.; Gil-García L.; Ortega J.A.; Dasgupta S.	Agricultural Water Management	2022	10.1016/j.agwat.2022.107938	4	This paper assesses the feasibility and robustness of an index-based insurance scheme against hydrological droughts under climate change. To this end, we develop a grand ensemble that samples both modeling and scenario uncertainty in the estimation of the insurance risk premium, so to reveal potential unfavorable surprises and minimize regret in the design of the proposed insurance scheme.
6	The leader, the keeper, and the follower? A legitimacy perspective on the governance of varietal innovation systems for climate changes adaptation. The case of sunflower hybrids in France	Akimowicz M.; Del Corso J.-P.; Gallai N.; Képhaliacos C.	Agricultural Systems	2022	10.1016/j.agsy.2022.103498	4	This article tackles the issue of farmers' varietal innovation development and adoption with the intent to highlight pathways for more resilient and sustainable agricultural systems. In particular, it explores the governance of the French sunflower varietal innovation system to assess its legitimacy. The objectives are therefore (1) to provide a relevant institutionalist framework based on the concepts of governance and legitimacy, and (2) to discuss opportunities to unlock the current situation that sees varietal innovation not entirely responding to the needs of farmers.
6	The influences on farmers' planned and actual farm adaptation decisions: Evidence from small-scale irrigation schemes in South-Eastern Africa	Abebe F.; Zuo A.; Wheeler S.A.; Bjornlund H.; Chilundo M.; Kissoly L.; Dube T.	Ecological Economics	2022	10.1016/j.ecolecon.2022.107594	4	Studies are scarce linking planned farmer adaptation practices with their actual practices over time. This study addresses this gap by investigating planned and actual adaptation behaviour, using data collected in 2014 and 2017, from various irrigation schemes in south-eastern Africa.
6	European Green Transition Implications on Africa's Livestock Sector Development and Resilience to Climate Change	Ndue K.; Pál G.	Sustainability (Switzerland)	2022	10.3390/su142114401	4	The main challenge is finding Africa's space and position within the desired holistic approach, as Africa's economy is agriculturally driven. One key African agricultural sub-sector significantly impacting livelihoods is livestock, which supports up to 80% of the rural livelihoods and which grapples with challenges in satisfying the needs of a fast-growing population. What could the EU green transition mean to this sector?

2	Pesticide Safety Awareness among Rural Farmers in Dadinkowa, Gombe State, Nigeria	Moda H.M.; Anang D.M.; Moses N.; Manjo F.M.; Joshua V.I.; Christopher N.; Doka P.; Danjin M.	International Journal of Environmental Research and Public Health	2022	10.3390/ijerph192113728	4	Knowledge, awareness, and practices related to pesticide storage, handling, application, and containers disposal among the farmers were measured.
6	Global deforestation revisited: The role of weak institutions	Moreira-Dantas I.R.; Söder M.	Land Use Policy	2022	10.1016/j.landusepol.2022.106383	4	This paper offers empirical-based evidence about the relationship between institutional factors and forest cover conversion. The role of weak institutions is explored by employing a logistic model of recent high-resolution global remote sensing data from the European Space Agency (ESA) Climate Change Initiative Land Cover (CCI-LC) from 1992 and 2015. We assess the cross-country associations of the Corruption Perception Index (CPI) and the World Bank Government Effectiveness (GE) index while controlling for physiographic and structural variables.
2	Assessment of flood vulnerability of riverine island community using a composite flood vulnerability index	Sarker M.N.I.; Alam G.M.M.; Firdaus R.B.R.; Biswas J.C.; Islam A.R.M.T.; Raihan M.L.; Hattori T.; Alam K.; Joshi N.P.; Shaw R.	International Journal of Disaster Risk Reduction	2022	10.1016/j.ijdrr.2022.103306	4	Therefore, this study assesses the vulnerability level of riverine island dwellers to flooding. Data were collected from 384 household heads living in geographically isolated char areas.
2	Consumer attitudes toward dairy products from sheep and goats: A cross-continental perspective	Vargas-Bello-Pérez E.; Tajonar K.; Foggi G.; Mele M.; Simitzis P.; Mavrommatis A.; Tsiplakou E.; Habib M.R.; Gonzalez-Ronquillo M.; Toro-Mujica P.	Journal of Dairy Science	2022	10.3168/jds.2022-21894	4	This study aimed to assess consumer knowledge, attitudes, and perceptions toward dairy products from sheep and goats. A web-based survey was conducted in Latin America (Mexico and Chile), Europe (Italy, Spain, Greece, and Denmark), and Asia (Bangladesh).
2	Understanding the role of groundwater in the lives of rural women in India	Swaraj A.; Maheshwari B.	World Water Policy	2022	10.1002/wwp2.12085	4	The main aim of this article is to examine the water challenges of Indian rural women in their routine life and discuss the impacts of depleting groundwater resources on their education, health and livelihood of their families. It also examines government policies, initiatives, and strategies that can potentially involve women in achieving sustainable water futures.
2	Combating climate change – What, where and how to implement adaptive measures in the agriculture sector of Öland, Sweden, keeping in view the constraints of carrying capacities and risk of maladaptation	Ibrahim M.A.; Johansson M.	Land Use Policy	2022	10.1016/j.landusepol.2022.106358	4	This article is one step towards a deeper understanding of “what”, “where” and “how” related questions on climate change adaptation in connection to constraints of carrying capacities and risks of maladaptation. A GIS based framework was employed for generating risk maps for identification of nutrient surplus and discharge hotspots “i.e. Where to implement?”.
2	Ecosystem-based fisheries risk assessment and forecasting considering a spatio-temporal component in Korean waters	Kim H.; Kang H.; Zhang C.-I.	Ocean and Coastal Management	2022	10.1016/j.ocecoaman.2022.106356	4	In this study, the IFRAME was extended to assess and forecast ecosystem dynamics and risk indices in a spatio-temporal context. The distribution of biomass and changes in risk of chub mackerel were predicted using the extended IFRAME, based on scenarios considering changes in climate and variations in fishing mortality.
6	Environmental change and groundwater variability in South Bihar, India	Sharma A.; Maharana P.; Sahoo S.; Sharma P.	Groundwater for Sustainable Development	2022	10.1016/j.gsd.2022.100846	4	In the last decade, researchers have underscored the need for carrying out climate change analysis at regional and sub-regional levels. Against this backdrop, we analyzed the climatic variability and environmental changes that occurred during the last seven decades (1958–2019) and their impact on groundwater variability in South Bihar, India.
6	Rice farmers’ perceptions about temperature and rainfall variations, respective adaptation measures, and determinants: Implications for sustainable farming systems	Khan N.A.; Shah A.A.; Chowdhury A.; Tariq M.A.U.R.; Khanal U.	Frontiers in Environmental Science	2022	10.3389/fenvs.2022.997673	6	This study explores farmers’ perception of and adaptation strategies to climate change and their determinants in the rice-growing zone of Punjab province, as this region of the country is highly vulnerable to climate change impacts.
12	Impacts of climate change and environmental degradation on children in Malaysia	Sahani M.; Othman H.; Kwan S.C.; Juneng L.; Ibrahim M.F.; Hod R.; Zaini Z.I.; Mustafa M.; Nnafie I.; Ching L.C.; Dambul R.; Varkkey H.; Phung V.L.H.; Mamood S.N.H.; Karim N.; Abu Bakar N.F.; Wahab M.I.A.; Zulfakar S.S.; Rosli Y.	Frontiers in Public Health	2022	10.3389/fpubh.2022.909779	4	The impacts of climate change and degradation are increasingly felt in Malaysia. While everyone is vulnerable to these impacts, the health and wellbeing of children are disproportionately affected. We carried out a study composed of two major components. The first component is an environmental epidemiology study comprised of three sub-studies: (i) a global climate model (GCM) simulating specific health-sector climate indices; (ii) a time-series study to estimate the risk of childhood respiratory disease attributable to ambient air pollution; and (iii) a case-crossover study to identify the association between haze and under-five mortality in Malaysia.
6	Climate change induced human displacement in Bangladesh: Implications on the livelihood of displaced riverine island dwellers and their adaptation strategies	Hossain B.; Shi G.; Ajiang C.; Sarker M.N.I.; Sohel M.S.; Sun Z.; Yang Q.	Frontiers in Psychology	2022	10.3389/fpsyg.2022.964648	4	This study intends to investigate the impact of climate change on internally displaced char people’s lives and livelihoods along with local adaptation strategies and hindrances to the coping mechanism.
6	Implementing Local Climate Change Adaptation Actions: The Role of Various Policy Instruments in Mopane (Colophospermum mopane) Woodlands, Northern Namibia	Nikodemus A.; Hájek M.	Forests	2022	10.3390/f13101682	4	This study aims to investigate this subject from the mopane woodlands’ point of view to understand the implementation of policy instruments for climate change adaptation in the mopane woodlands. We conducted an online survey focusing on multiple stakeholders, experts in different sectors, and local communities.
6	Transition to Organic Farming: A Case from Hungary	Király G.; Giuseppina R.; Tóth J.	Agronomy	2022	10.3390/agronomy12102435	4	In this study, we investigated the impacts of certain factors on the possibility of Hungarian farmers’ conversion to organic production in the context of climate change adaptation.
6	Can Collecting Water Fees Really Promote Agricultural Water-Saving? Evidence from Seasonal Water Shortage Areas in South China	Li X.	Sustainability (Switzerland)	2022	10.3390/su141912881	4	Based on a survey and empirical analysis, this study identifies the key determinants of farmers’ agricultural water-saving behavior, particularly to verify whether collecting water fees helps to promote agricultural water-saving.
6	Rural Farmers’ Cognition and Climate Change Adaptation Impact on Cash Crop Productivity: Evidence from a Recent Study	Khan N.; Ma J.; Kassem H.S.; Kazim R.; Ray R.L.; Ihtisham M.; Zhang S.	International Journal of Environmental Research and Public Health	2022	10.3390/ijerph191912556	4	This paper highlights farmers’ autonomous CC adaptation strategies and their influence on cash crop (maize for this study) yield under prevailing circumstances. The current study used a simultaneous equation model to examine the different adaptation impacts on adapters and non-adapters
2	Evaluation of the Effects of Climate Change on Agricultural Production-La Rinconada Town Center – Ancash, Peru	Campomanes G.P.; Campomanes M.P.	Environment and Ecology Research	2022	10.13189/eer.2022.100502	6	The objective of this research is to evaluate the effects of climate change on agricultural production in the town of Rinconada in the district of Santa, Ancash, Peru.

6	Social Memory in the Mekong's Changing Floodscapes: Narratives of Agrarian Communities' Adaptation	Tran T.A.; Rigg J.; Taylor D.; Miller M.A.; Pittock J.; Le P.T.	Human Ecology	2022	10.1007/s10745-022-00362-0	4	This study employs the Vietnamese Mekong floodplains as an exemplary case to illustrate how floods impact agrarian communities and how they have experienced flood alterations driven by hydropower development and climate change in recent years.
2	Exploring farmers' perceptions and lessons learned from the 2015–2018 drought in the Western Cape, South Africa	Theron S.N.; Archer E.R.M.; Midgley S.J.E.; Walker S.	Journal of Rural Studies	2022	10.1016/j.jrurstud.2022.09.002	3	This study aimed to understand wheat farmers' and apple producers' perceptions of climate change and adaptation in the Western Cape, South Africa, and establish whether the recent drought offered lessons for adaptation.
6	Analysis of perceived robustness, adaptability and transformability of Spanish extensive livestock farms under alternative challenging scenarios	Daniele B.-C.; Barbara S.; Isabel B.; Alberto G.	Agricultural Systems	2022	10.1016/j.agsy.2022.103487	4	The research question underlying this paper is: which resilience capacities may help livestock farmers deal with different types of challenges? The specific research objectives are: 1) to quantify the resilience capacities of robustness, adaptability and transformability and the challenges as perceived by farmers; 2) to identify the main challenges affecting the perceived resilience capacities; and 3) to evaluate how perceived resilience capacities perform under alternative scenarios.
6	Civil society's perception of forest ecosystem services. A case study in the Western Alps	Bruzzese S.; Blanc S.; Merlino V.M.; Massaglia S.; Brun F.	Frontiers in Psychology	2022	10.3389/fpsyg.2022.1000043	4	This paper investigated civil society's perception and knowledge toward these services; in addition, the presence of attitudinal or behavioural patterns regarding individual's preference, was assessed.
6	Extreme Weather Events and Spiraling Debt: A Double Whammy for Bangladeshis Affected by Climate Change	Atiqul Haq S.M.	Frontiers in Psychology	2022	10.3389/fpsyg.2022.879219	3	The study was conducted in different areas of Bangladesh, not specifically with small-scale populations
2	How Modelers Model: The Overlooked Social and Human Dimensions in Model Intercomparison Studies	Albanito F.; McBey D.; Harrison M.; Smith P.; Ehrhardt F.; Bhatia A.; Bellocchi G.; Brilli L.; Carozzi M.; Christie K.; Doltra J.; Dorich C.; Doro L.; Grace P.; Grant B.; Léonard J.; Liebig M.; Ludemann C.; Martin R.; Meier E.; Meyer R.; De Antoni Migliorati M.; Myrgiotis V.; Recous S.; Sándor R.; Snow V.; Soussana J.-F.; Smith W.N.; Fitton N.	Environmental Science and Technology	2022	10.1021/acs.est.2c02023	4	There is a growing realization that the complexity of model ensemble studies depends not only on the models used but also on the experience and approach used by modelers to calibrate and validate results, which remain a source of uncertainty. Here, we applied a multi-criteria decision-making method to investigate the rationale applied by modelers in a model ensemble study where 12 process-based different biogeochemical model types were compared across five successive calibration stages. The modelers shared a common level of agreement about the importance of the variables used to initialize their models for calibration
2	Relative advantage and complexity: Predicting the rate of adoption of agricultural innovations	Kaine G.; Wright V.	Frontiers in Agronomy	2022	10.3389/fagro.2022.967605	4	In this paper we describe a novel approach to predicting rates of adoption with respect to agricultural technologies and practices drawing on a dual-process model of consumer decision-making and a method for describing the complexity of innovations in farm systems.
2	Consumer attitudes to vertical farming in the United Kingdom and Germany	Ha B.; Roigard C.M.; Chheang S.L.; Ryan G.S.; Jin D.; Hedderley D.I.; Jaeger S.R.	Acta Horticulturae	2022	10.17660/ActaHortic.2022.1345.22	4	The present study explores consumer perceptions and beliefs about indoor VF, where crops are grown in vertically stacked layers under highly controlled conditions that allow for the optimisation of resource use, including nutrients, water, energy and space.
2	Application of Discrete Choice Experiment in Agricultural Risk Management: A Review	Čop T.; Njavro M.	Sustainability (Switzerland)	2022	10.3390/su141710609	4	This paper reviews current knowledge on risk management in agriculture from the behavioral perspective, and from the perspective experimental economics in particular, emphasizing a discrete choice experiment approach. A discrete choice experiment (DCE) elicits stated preferences through hypothetical choices and have been extensively applied in research on risk preferences and farmers' willingness to apply different risk management strategies. The objective of this paper was to determine the frequency at which papers are published and their use in discrete choice experiments in general and in agriculture and emphasizes risk management in agriculture using bibliometric analysis.
6	Climate change opportunities reduce farmers' risk perception: Extension of the value-belief-norm theory in the context of Finnish agriculture	Sorvali J.; Liu X.; Kaseva J.	Frontiers in Psychology	2022	10.3389/fpsyg.2022.939201	4	This research is based on the theory of value-belief-norm (VBN) as a predictive model of pro-environmental agricultural behavior. We extend the theory by studying how opportunities caused by climate change affect pro-environmental behavior in agriculture and present differences between farmer groups and experiment with the longitudinal possibilities of the theoretical model.
2	Climate justice for the southwestern coastal region of Bangladesh	Ashrafuzzaman M.; Gomes C.; Guerra J.	Frontiers in Climate	2022	10.3389/fclim.2022.881709	4	This study employed the mixed method, combining qualitative and quantitative methods of data collection and analysis for development of a framework for climate justice.
6	Factors Influencing the Adoption of Climate-Smart Agricultural Practice by Small-Scale Farming Households in Wondo Genet, Southern Ethiopia	Kassa B.A.; Abdi A.T.	SAGE Open	2022	10.1177/21582440221121604	4	The purpose of this study was to investigate the factors that influence farmers' adoption of CSA practices in the Wondo Genet Woreda in southern Ethiopia.
2	Challenges and prospects of using treated wastewater to manage water scarcity crises in the Gulf Cooperation Council countries	Qureshi A.S.	Desalination and Water Treatment	2022	10.5004/dwt.2022.28216	4	This paper reviews the status of available water resources in the GCC countries.
2	Smart and Sustainable Buildings and Infrastructure	Rao V.M.; Samal A.K.	Ymer	2022	10.37896/YMER21.06/64	4	The Smart cities project in India and all other major projects in infrastructure, buildings, energy, social and economic infrastructure, industry and habitations, all look for leveraging technology to carbon emission standards and climate change commitments
2	Farm level adaptation to climate change in north China: behavioural practices and potential drivers	Liu W.; Du C.; Yang T.; Jin S.	Environmental Sociology	2022	10.1080/23251042.2022.2147890	4	This research targeted to construct an integrated picture of the farm level adaptation to climate change in north China. We performed a field survey in Hebei province, and uncover which farmer behaviours in reality constitute an adaptation and analyses the characteristics and heterogeneity of these behaviours.
6	The influence of socioeconomic factors on individual and household adaptation strategies to climate change risks in Port Harcourt, Nigeria	Okunola O.H.; Simatele M.D.; Olowoporoku O.	Journal of Integrative Environmental Sciences	2022	10.1080/1943815X.2022.2143821	4	Hence, this study addresses this need by examining the factors influencing individual and household adaptation strategies to climate risk in Port Harcourt Metropolis, Nigeria.
10	Farmers' perspectives on the adoption of smart farming technology to support food farming in Aceh Province, Indonesia	Agussabti A.; Rahmaddiansyah R.; Hamid A.H.; Zakaria Z.; Munawar A.A.; Abu Bakar B.	Open Agriculture	2022	10.1515/opag-2022-0145	4	This research examined the adoption readiness in using SFT for three food commodities in Aceh Province, Indonesia, namely rice, maize, and potatoes.
2	Impact of Climate Change and Technological Advancement on Cotton Production: Evidence from Xinjiang Region, China	Arshad M.U.; Yuanfeng Z.; Hanif S.; Fatima F.	Journal of Agricultural Science and Technology	2022		4	This study empirically investigated the relationship between climate and non-climate variables on Xinjiang Region's cotton production over the last three decades.
6	Agriculture, COVID-19 and mental health: Does gender matter?	Budge H.; Shortall S.	Sociologia Ruralis	2022	10.1111/soru.12408	4	This article considers the impact of Coronavirus (COVID-19) on men and women on farms. Using qualitative interviews and focus groups, the impact of the pandemic on men's and women's work and social life within the family is explored.

6	Living with typhoons and changing weather patterns: Indigenous resilience and the adaptation pathways of smallholder farmers in Taiwan	Bayrak M.M.; Hung L.-S.; Hsu Y.-Y.	Sustainability Science	2022	10.1007/s11625-022-01247-3	4	Indigenous resilience is an increasingly popular topic in research on how the world's indigenous peoples cope with and adapt to global climate change. Currently, a scientific gap exists in the understanding of the factors shaping Indigenous resilience. This study aimed to address this gap by focusing on two Indigenous Tayal communities in northern Taiwan and how they have coped with and built resilience in the face of climate change and climate-related disasters.
2	Digital Agriculture in Viet Nam: Conditions and Prospect of Development	Loi N.T.N.	Agris On-line Papers in Economics and Informatics	2022	10.7160/aol.2022.140304	4	The real context of climate change and pandemic has emphasized the enormous significance of agriculture to society and paved a path to digitization. Each country's agricultural digitalization strategies must not only focus on the technological aspects of the production system but as well present an overview of how this field of study is establishing and developing. To address this issue, a research was carried out to identify priority research questions concerning digital agriculture in Viet Nam, but with a view to also informing international contexts.
2	An inquiry on north-eastern Italian farmers' perception of climate change and related risks to agriculture	Nassivera F.; Gallenti G.; Carzedda M.	Italian Review of Agricultural Economics	2022	10.36253/rea-13382	3	Our study aims to investigate north-eastern Italian farmers' perception of climate change-related risks and attitudes towards adaptation strategies, in order to promote the adoption of effective communication strategies and the development of more attractive insurance schemes to widen famers' interests.
21	Climate change, disaster management and primary health care in Zimbabwe	Ray S.; Goronga T.; Chigiya P.T.; Madzimbamuto F.D.	African Journal of Primary Health Care and Family Medicine	2022	10.4102/PHCFM.V14I1.3684	4	This article describes the role health professionals and civil society can play in educating the public on the dangers faced in the near future as a result of climate change and actions that can be taken to become more resilient and to mitigate this impact.
6	A PLS-SEM approach to determine farmers' awareness about climate change mitigation and adaptation strategies: pathway toward sustainable environment and agricultural productivity	Sohail M.T.	Environmental Science and Pollution Research	2022	10.1007/s11356-022-23471-1	4	This research was conducted in a significant agricultural region to gauge farmers' knowledge of climate change adaption strategies.
6	Religion and Adaptation to Climatic Variability in Agricultural Frontiers: Mennonite Farming in El Chaco, Paraguay	Trinidad-Da Silva A.; Miró J.J.; Sauri D.	Professional Geographer	2022	10.1080/00330124.2022.2111688	3	This article first analyzes climate data for the period 1950 through 2016 to identify potential increases in variability in temperature and precipitation trends. Second, the article examines adaptation practices to climate variability and perceptions of climate change in the region by a variety of informants, above all Mennonite cooperatives. A
6	Impacts of local conservation strategies on forest flora species of the Ambalara forest reserve in the Wa East District, Ghana	Yahaya A.-K.; Tijani A.-F.K.; Alhassan A.	International Journal of Sustainable Development and World Ecology	2022	10.1080/13504509.2022.2120108	4	This study examines the impact of strategies used by local actors such as the land priest (tendaana), sectional heads, chiefs (naamene), diviners, women leaders (magazias) and youth groups on forest flora species of the forest reserve. The strategies used by local actors are taboos, creation of traditional firebelts, revered tree species, bans and awareness creation. The study reveals that, fringe communities endorse the chiefs (naamene) and the land priests (tendaana) as the most effective actors in the conservation of forest flora species of the reserve and the traditional fire belt creation as the most effective conservation strategy.
2	Climate variability and extractivism exposures: Understanding household perspectives on livelihood resilience in rural Ghana	Tannor S.J.; Kelboro G.; Greve K.; Borgemeister C.; Tischbein B.	Extractive Industries and Society	2022	10.1016/j.exis.2022.101164	4	The resilience of African rural livelihoods is at risk due to over-reliance on rain-fed agriculture, which increasingly suffers from climate variability. Extractive communities are exposed to changes from extractivism and climate conditions. The double exposure framework is employed to contextualise factors influencing households' perspectives on the overlapping impacts of these change processes on livelihoods
6	Table olive farmers' sources of risk and risk management strategies	Tok N.	New Medit	2022	10.30682/nm2203f	3	This study identifies perceptions of risk sources and managements strategies in the region, clarifying their relative importance, as farmers perceive them, using a survey conducted among 121 selected purposefully farmers.
2	'No longer solid': perceived impacts of permafrost thaw in three Arctic communities	Ramage J.; Jungsberg L.; Meyer A.; Gartler S.	Polar Geography	2022	10.1080/1088937X.2022.2105973	4	We present the results of a survey on communities' perceptions of permafrost thaw, with a focus on subsistence activities, carried out between 2019 and 2020 in Aklavik (Northwest Territories, Canada), Longyearbyen (Svalbard, Norway), and Qeqertarsuaq (Qeqertalik Municipality, Greenland).
1	Women and climate change adaptation behaviour: What's the problem and solution?	Goli, I; Abadi, MON; Lashgarara, F; Tanaskovik, V; Chukaliev, O; Viira, AH; Pour, M; Sklenicka, P; Janeckova, K; Azadi, H	Climate and Development	2022	10.1080/17565529.2022.2121597	4	Therefore, the purpose of this study was to examine the behaviour of female rice farmers in Mazandaran Province, in northern Iran, toward climate change adaptation using protection motivation theory (PMT).
7	What evidence exists on conceptual differences in climate change perceptions of smallholders? A systematic map protocol	Troncarelli, L.T.; Morsello, C.	Environmental Evidence	2022	10.1186/s13750-022-00284-w	8	This article is a systematic map protocol
1	Assessing climate change-related losses and damages and adaptation constraints to address them: Evidence from flood-prone riverine communities in Southern Nigeria	Amaechina, EC; Anugwa, IQ; Agwu, AE; Ifelunini, AI; Umeonuora, TG; Okwor, CA	Environmental Development	2022	10.1016/j.envdev.2022.100780	4	This study was aimed at assessing climate change-related losses and damages due to floods among farm households in riverine areas of Southern Nigeria
1	Exploring Gender and Climate Change Nexus, and Empowering Women in the South Western Coastal Region of Bangladesh for Adaptation and Mitigation	Ashrafuzzaman, M; Gomes, C; Dias, JM; Cerda, A	Climate	2022	10.3390/cli10110172	4	This study has been conducted to identify vulnerabilities and effects of climate change on women in 12 unions in Shyamnagar upazila in the Satkhira district in the Southwestern Coastal Region of Bangladesh (SWCRB).
1	Combating climate change-What, where and how to implement adaptive measures in the agriculture sector of O?land, Sweden, keeping in view the constraints of carrying capacities and risk of maladaptation	Ibrahim, MA; Johansson, M	Land Use Policy	2022	10.1016/j.lusepol.2022.106358	4	This article is one step towards a deeper understanding of "what", "where" and "how" related questions on climate change adaptation in connection to constraints of carrying capacities and risks of maladaptation.
1	Are We Adapting to Climate Change? Evidence from the High-Quality Agri-Food Sector in the Veneto Region	Salpina, D; Pagliacci, F	Sustainability	2022	10.3390/su141811482	4	In this context, understanding whether and how agents involved in agri-food GIs production are adapting to climate change is a crucial issue, together with pointing out the role played by either economic incentives or subsidies in the implementation of adaptation measures. To answer these questions, this research focuses on the case of the agri-food sector of the Veneto Region.
1	The Adaptation Behaviour of Marine Fishermen towards Climate Change and Food Security: An Application of the Theory of Planned Behaviour and Health Belief Model	Begum, M; Masud, MM; Alam, L; Bin Mokhtar, M; Amir, AA	Sustainability	2022	10.3390/su142114001	4	Thus, the goal of this study is to examine the various factors that impact the adaptation behaviour of marine fishermen towards climate change.
1	Climate Change Adaptation in Non-Timber Forest Products: How Resilient are Small Shiitake Producers?	Miyake, Y; Kohsaka, R	Journal of Sustainability Forestry	2022	10.1080/10549811.2022.2123822	4	This study focused on shiitake mushrooms as non-timber forestry products adapting to climate change in an area to examine the practice of sustainable forest management.

1	Graduate Students' Knowledge Levels on Climate Change in the Departments of Agricultural Economics in Turkey	Bozoglu, M; Topuz, BK; Baser, U; Shahbaz, P; Eroglu, NA	Journal of Agricultural Science and Technology	2022		3	This study aimed to determine CC Knowledge Levels (CCKL) of candidate graduates and to examine the factors influencing their knowledge levels.
1	Perceptions of the Impact of Climate Change on Performance of Fish Hatcheries in Bangladesh: An Empirical Study	Siddique, MA; Ahammad, AKS; Mahalder, B; Alam, MM; Hasan, NA; Abul Bashar; Biswas, JC; Haque, MM	Fishes	2022	10.3390/fishes7050270	3	This study assesses the impacts of CC on fish seed production in hatcheries from the perspective of hatchery owners. A semi-structured questionnaire survey was conducted with 60 hatchery owners in five sub-districts (Trishal, Mymensingh Sadar, Gouripur, Fulbaria, and Muktagacha) of the Mymensingh district, the highest aquaculture-producing zone in Bangladesh.
1	Farmer adoption and intensity of use of extreme weather adaptation and mitigation strategies: evidence from a sample of Missouri farmers	Skevas, T; Massey, R; Grashuis, J	Climatic Change	2022	10.1007/s10584-022-03439-3	4	The aim of this study is to assess the adoption and intensity of use of extreme weather adaptation and mitigation strategies among a sample of Missouri farmers and to identify the factors that influence adaptation and mitigation behavior.
1	Agricultural co-operatives for managing natural capital to achieve UN Sustainable Development Goals 12-15: A conceptual framework	Ghauri, S; Jackson, EL; Marinova, D; Mohammadi, H	Journal of Co-Operative Organization and Management	2022	10.1016/j.jcom.2022.100188	4	In this paper we explored the literature to develop a conceptual framework to determine how primary industry co-operatives (such as in agriculture and aquaculture) can play a role in managing natural capital.
1	Willingness to Pay for Weather-Indexed Insurance: Evidence from Cambodian Rice Farmers	Wang, QX; Soksophors, Y; Barlis, A; Mushtaq, S; Phanna, K; Swaans, C; Rodulfo, D	Sustainability	2022	10.3390/su142114558	4	This study examines Cambodian rice farmers' willingness to pay for the weather-indexed insurance (WII) proposed to manage the financial impact of shifting monsoon rainfall patterns in Battambang Province in north-western Cambodia.
1	Wastewater reclamation trends in Thailand	Kanchanapiya, P; Tantisattayakul, T	Water Science and Techonology	2022	10.2166/wst.2022.375	4	This study aims to provide an overview of the wastewater reclamation, present research trends, currently operating WWTPs as well as opportunities and challenges to speed up water reuse activities in Thailand.
1	When crop producers face dynamic climate risks in Ethiopia: exploring determinants behind choices of adaptation strategies	Bedeke, SB	Climate Research	2022	10.3354/cr01704	4	This study contributes to the existing research by identifying determinants behind the choice of adaptation strategies in 2 districts of Ethiopia.
1	Do agricultural extension services promote adoption of soil and water conservation practices? Evidence from Northern Ghana	Danso-Abbeam, G	Journal of Agriculture and Food Research	2022	10.1016/j.jafr.2022.100381	4	This study examined the impact of agricultural extension services on the adoption of soil and water conservation (SWC) practices using data ob-tained from farming households in Northern Ghana.
1	Are positive farmers more productive? Investigating the relationship between positivity ratio and agricultural productivity	Bukchin-Peles, S	Outolook on Agriculture	2022	10.1177/00307270221130087	4	We suggest a relation between farmers' positivity level (ratio of positive to negative emotions) and agricultural productivity. This hypothesis's theoretical roots lie in the broaden-and-build theory, which argues that the positivity level is at the core of psychological flourishing and significantly impacts social and intellectual abilities.
1	The future of CRISPR gene editing according to plant scientists	de Lange, J; Nalley, LL; Yang, W; Shew, A; de Steur, H	Science	2022	10.1016/j.isci.2022.105012	4	This study surveyed 669 plant scientists globally to elicit how (which outcomes of gene editing), where (which continent) and what (which crops) are most likely to benefit from CRISPR research and if there is a consensus about specific barriers to commercial adoption in agriculture.
1	A systematic PLS-SEM approach on assessment of indigenous knowledge in adapting to floods; A way forward to sustainable agriculture	Sohail, MT; Chen, SM	Frontiers in Plant Science	2022	10.3389/fpls.2022.990785	4	The present study was conducted in one of the major agriculture areas to check farmers indigenous knowledge about the impacts of floods on their farming lives, food security, sustainable development, and risk assessment.
1	Microeconomic adaptation to severe climate disturbances on Australian coral reefs	Bartelet, HA; Barnes, ML; Cumming, GS	Ambio	2022	10.1007/s13280-022-01798-w	3	To address this gap, we surveyed about half (57 of 109) of Australian reef tourism operators to understand how they were affected by and responded to severe impacts from bleaching and cyclones
1	What Drives the Adoption of Agricultural Green Production Technologies? An Extension of TAM in Agriculture	Dai, QC; Cheng, KQ	Sustainability	2022	10.3390/su142114457	4	Understanding farmers' intentions to use agricultural green production technologies (AGPTs) is essential for reducing agricultural pollution. Drawing on the Technology Acceptance Model (TAM), this study analyzes the impacts of government regulation and social network on farmers' AGPTs adoption behavior.
1	The Economics of Aquatic Plants: The Case of Algae and Duckweed	Hochman, G; Palatnik, RR	Annual Review of Resource Economics	2022	10.1146/annurev-resource-111920-011624	4	This review examines global microalgae, seaweeds, and duckweed (MSD) production status and trends. It focuses on cultivation, recognizing the sector's existing and potential contributions and benefits, highlighting a variety of constraints and barriers over the sector's sustainable development. It also discusses lessons learned and ways forward to unlock the sector's full potential.
1	Invasion Adaptation: A Socio-ecological Assessment of Cherry Growers' Adaptation Potential to Spotted Wing Drosophila	Capnerhurst, H; Fischer, AP; Perfecto, I	Human Ecology	2022	10.1007/s10745-022-00341-5	4	This study evaluated the potential of cultural management practices (CMPs) to service sustainable social and ecological adaptation to the invasive fruit fly spotted wing drosophila (SWD).
1	Perceptional Differences on the Concept of Sustainability Between Japanese and Foreign Students	Mammadova, A	European Journal of Sustainable Development	2022	10.14207/ejsd.2022.v11n4p25	4	We have evaluated perceptional difference between 80 Japanese and 80 Non-Japanese students, by creating the special educational program which included topics on global and regional issues such as biodiversity loss, climate change, environmental pollution social issues like gender imbalance, health care, human rights and etc.
9	Interactions between climate and COVID-19	Ford, J; Zavaleta-Cortijo, C; Ainembabazi, T; Anza-Ramirez, C; Arotoma-Rojas, I; Bezerra, J; Chicmana-Zapata, V; Galappaththi, EK; Hangula, M; Kazaana, C; Lwasa, S; Namanya, D; Nkwinti, N; Nuwagira, R; Okware, S; Osipova, M; Pickering, K; Singh, C; Berrang-Ford, L; Hyams, K; Miranda, JJ; Naylor, A; New, M; Berrang-Ford, PL; COVID Observatory	Lancet Planetary Health	2022	10.1016/S2542-5196(22)00174-7	4	In this Personal View, we explain the ways that climatic risks affect the transmission, perception, response, and lived experience of COVID-19.
1	Hutsuls' perceptions of forests and uses of forest resource in Ukrainian and Romanian Bukovina	Mattalia, G; Stryamets, N; Balazsi, A; Molnar, G; Gliga, A; Pieroni, A; Soukand, R; Reyes-Garcia, V	International Forestry Review	2022		4	We examined perceptions of forest and forest resource use among two Hutsul communities in Bukovina sharing a similar cultural background but living in a region divided by the national border created between Romania and Ukraine in the 1940s.
1	Facing marine debris in China	Kang, B; Lin, L; Li, Y; Peng, X; Sun, JC	Marine Pollution Bulletin	2022	10.1016/j.marpolbul.2022.114158	4	This study is about marine Debris in China

1	Assessing Community Perceptions on Urban Flood Resilience in Sri Lanka	Hewawasam, V; Matsui, K	Geosciences	2022	10.3390/geosciences12110406	4	This paper examines community-specific flood resilience by looking at Sri Lanka's most flood-prone areas: the Kolonnawa and Kaduwela divisional secretariat divisions of Colombo.
1	Future impacts of Urban and Peri-urban agriculture on carbon stock and land surface temperatures in India	Sagar, US; Singh, Y; Mahalingam, A; Malladi, T	Urban Climate	2022	10.1016/j.uclim.2022.101267	4	The present study aims to quantify the impact of UPA in the cities of Chennai and Bengaluru in India.
1	When the environment is destroyed, you're destroyed: Achieving Indigenous led pipeline justice	Hurlbert, MA; Datta, R	Energy Research & Social Science	2022	10.1016/j.erss.2022.102711	4	Based on socio-legal applied research including a legal analysis, as well as twenty interviews with Indigenous knowledge keepers in Alberta and Saskatchewan, this article explores Indigenous perspectives surrounding oil and gas pipelines, Indigenous pipeline justice, and specifically what an Indigenous led pipeline relation would look like.
1	Social Constructions of Health-Environment Risks: A Comparison of Fishing Community and Expert Perceptions of Cyanobacterial Blooms	Ziegler, CS; Roegner, AF; Aura, CM; Fiorella, KJ	Society & Natural Resources	2022	10.1080/08941920.2022.2135151	4	The study also examines resource user and expert perceptions of how these blooms have impacted the livelihoods of fishers and aquaculturalists, and how regional experts have responded.
1	Perceptions, Problems and Prospects of Contract Farming: Insights from Rice Production in Vietnam	Tuyen, MC; Sirisupluxana, P; Bunyasiri, I; Hung, PX	Sustainability	2022	10.3390/su141912472	4	To address these evidence gaps, this study surveys stakeholders, ranks the perceived advantages and disadvantages of CF, and investigates the problems and prospects of CF.
1	On the road to sustainable transport: Acceptance and preferences for renewable fuel production infrastructure	Linzenich, A; Engelmann, L; Arning, K; Becker, T; Wolff, M; Walther, G; Ziefle, M	Frontiers in Energy Research	2022	10.3389/fenrg.2022.989553	4	Using a conjoint analysis approach, the current study investigates preferences of laypeople (n = 303) for fuel production facilities in terms of siting location, plant size, raw material used in the production, and raw material transport.
1	Evaluation of agricultural drought in South Korea using socio-economic drought information	Lee, JW; Hong, EM; Kim, JU; Jang, WJ; Jung, CG; Kim, SJ	International Journal of Disaster Risk Reduction	2022	10.1016/j.ijdrr.2022.102936	4	The objectives of this study were to analyze the correlation between a socioeconomic drought information (SEDI) based on Internet news articles and agricultural drought data and to determine whether the SEDI can provide reliable information regarding damage due to agricultural drought.
1	Barriers and Opportunities: Specialty Cultivated Mushroom Production in the United States	Moxley, A; Ebel, R; Cripps, CL; Austin, CG; Stein, M; Winder, M	Sustainability	2022	10.3390/su141912591	4	This study looked at the barriers to and opportunities for cultivating, marketing, and consuming SCMs in the US by conducting a producer survey with SCM facilities in the US (n = 63).
1	Expert perceptions of seaweed farming for sustainable development	Spillias, S; Cottrell, RS; Kelly, R; O'Brien, KR; Adams, J; Bellgrove, A; Kelly, B; Kilpatrick, C; Layton, C; Macleod, C; Roberts, S; Stringer, D; McDonald-Madden, E	Journal of Cleaner Production	2022	10.1016/j.jclepro.2022.133052	4	The aim of this paper is to outline the opportunities for, and threats from, seaweed farming in the context of sustainability.
1	Estimating the value of ecosystem services in agricultural landscapes amid intensification pressures: The Brazilian case	Parron, LM; Villanueva, AJ; Glenk, K	Ecosystem Services	2022	10.1016/j.ecoser.2022.101476	4	In this context, the present paper provides estimates of the value of ES related to changes in land use and management in intensive agricultural landscapes in Brazil, using a discrete choice experiment.
1	The market-society-policy nexus in sustainable agriculture	Diaz-Siefer, P; Fonturbel, FE; Berasaluce, M; Huenchuleo, C; Lal, R; Mondaca, P; Celis-Diez, JL	Environment Development and Sustainability	2022	10.1007/s10668-022-02691-y	4	In this scientific essay, we aimed to answer this question not only by analyzing agricultural systems but also by the associated actors. Specifically, this scientific essay analyzed and discussed how agricultural systems integrate with the surrounding market, society, and policies.
1	Land Use and Land Cover Change Dynamics and Perceived Drivers in Rangeland Areas in Central Uganda	Kuule, DA; Ssentongo, B; Magaya, PJ; Mwesigwa, GY; Okurut, IT; Nyombi, K; Egeru, A; Tabuti, JRS	Land	2022	10.3390/land11091402	4	The aim of the study was to determine the perceived drivers of land use and land cover change in of Nakasongola district in the Central Uganda district to support decision making for present and future rangeland management.
1	Trehalose: A Key Player in Plant Growth Regulation and Tolerance to Abiotic Stresses	Hassan, MU; Nawaz, M; Shah, AN; Raza, A; Barbanti, L; Skalicky, M; Hashem, M; Brestic, M; Pandey, S; Alamri, S; Mostafa, YS; Sabagh, AEL; Qari, SH	Journal of Plant Growth Regulation	2022	10.1007/s00344-022-10851-7	4	This work aims to systematically review Tre's role as stress tolerance molecule and its crosstalk with other osmolytes under stress conditions, explaining mechanism of stress tolerance and pointing out areas for future research.
1	Fishermen's perceptions of constraints on adaptive capacity in the California market squid and California spiny lobster fisheries	Powell, F; Levine, A; Ordonez-Gauger, L	Frontiers in Marine Science	2022	10.3389/fmars.2022.1028280	4	Using fishermen interviews and feedback sessions, we explored fishermen's perceptions of constraints on their ability to adapt to change in two fisheries in the California Current System: California spiny lobster and California market squid.
1	Assessment of the Financial Benefits from Wind Farms in US Rural Locations	Haces-Fernandez, F	Journal of Risk and Financial Management	2022	10.3390/jrfm15100423	4	This article is about financial benefits from wind farms
1	Ecosystem Services and Linkages of Naturally Managed Monotheca buxifolia (Falc.) A. DC. Forests with Local Communities across Contiguous Mountainous Ranges in Pakistan	Ali, F; Khan, N; Rahmonov, O	Biology-Basel	2022	10.3390/biology11101469	4	The present study was designed to illuminate the link between mountain society and the consumption of the benefits from Monotheca phytocoenoses using the ecosystem services concept from the sphere of the socio-ecological system to cultural relations.
1	Vulnerability, impact and adaptation strategies of female farmers to climate variability	Dibakoane, S; Siyongwana, P; Shabalala, AN	Jamba-Journal of Disaster Risk Studies	2022	10.4102/jamba.v14i1.1302	4	This paper investigates the participation of women in crop production, key challenges and their coping strategies for climatic disturbances.
1	Weakening of Coastlines and Coastal Erosion in the Gulf of Guinea: The Case of the Kribi Coast in Cameroon	Fendoung, PM; Tchindjang, M; Hubert-Ferrari, A	Land	2022	10.3390/land11091557	4	The objective of this work is to analyze the kinematics of the Kribian coastline between 1973 and 2020; to quantify the levels of retreat, accretion, and stability; and finally, to discuss the factors influencing the evolution of the coastline.
1	An inventory of crop wild relatives and wild-utilized plants in Canada	Ulrich, JC; Moreau, TL; Luna-Perez, E; Beckett, KIS; Simon, LK; Migicovsky, Z; Diederichsen, A; Khoury, CK	Crop Science	2022	10.1002/csc2.20807	4	To assess current ex situ conservation of these plant species, we gathered a virtual metacollection of accession data from botanical gardens and national genebanks.
1	Through the Eyes of Forest Visitors-Perception and Scenic Preferences of Munich's Urban Proximate Woodlands	Lupp, G; Kantelberg, V; Fath, J; Hirschbeck, T; Kasbauer, C; Ritter, A; Schisslbauer, J; Pauleit, S	Forests	2022	10.3390/f13101584	3	Reflecting these management objectives, we examined the perception and scenic preferences of the resulting forest stands in Munich ' s urban proximate woodlands.

1	A field experiment exploring disturbance-and-recovery, and restoration methodology of Zostera capensis to support its role as a coastal protector	Amone-Mabuto, M; Hollander, J; Lugendo, B; Adams, JB; Bandeira, S	Nordic Journal of Botany	2022	10.1111/njb.03632	4	The following paper present a field experiment from Mozambique concerning disturbance-and-recovery effects of Zostera capensis, a highly impacted seagrass species in the region.
1	Implementation of Access and Benefit Sharing (ABS) from Biological Resources in the State of Gujarat	Kumar, D; Shanthakumar, S; Banerjee, M	Asian Biotechnology and Development Review	2022		4	For this paper, data related to Biodiversity Management Committees (BMCs), People's Biodiversity Registers (PBRs), and the status of applications for access and benefit sharing in states was gathered and analysed for the status of the implementation of access and benefit sharing (ABS) from biological resources in Gujarat.
1	Factors Influencing Risk during Wildfires: Contrasting Divergent Regions in the US	Noonan-Wright, E; Seielstad, C	Fire- Switzerland	2022	10.3390/fire5050131	3	Risk characterized by U.S. land managers during wildfires was evaluated from 2010-2017 to identify factors driving risk perceptions. Annotation from 282 wildfires in two regions with distinctive risk profiles, the Northwest and Southwest Geographic Areas, were qualitatively coded using the risk assessment framework of hazards, values, and probability from the Relative Risk Assessment in the Wildland Fire Decision Support System (WFDSS).
1	Understanding How Marine Protected Areas Influence Local Prosperity-A Case Study of Gili Matra, Indonesia	Rosadi, A; Dargusch, P; Taryono, T	International Journal of Environmental Research and Public Health	2022	10.3390/ijerph192013508	4	Therefore, stakeholders' perceptions of MPAs are fundamental in the planning and implementation of MPAs, which could improve the prosperity of the coastal communities.
1	Factors Affecting Farmers' Adoption of Flood Adaptation Strategies Using Structural Equation Modeling	Faruk, MO; Maharjan, KL	Water	2022	10.3390/w14193080	4	This study integrates psychological aspects based on PMT to assess farmers' flood adaptability.
1	Wildfire imagery reduces risk information-seeking among homeowners as property wildfire risk increases	Flint, HB; Champ, PA; Meldrum, JR; Brenkert-Smith, H	Communications Earth & Environment	2022	10.1038/s43247-022-00505-7	4	We tested whether this expectation matched homeowner response in the United States.
1	How do value-judgements enter model-based assessments of climate sensitivity?	Undorf, S; Pulkkinen, K; Wikman-Svahn, P; Bender, FAM	Climatic Change	2022	10.1007/s10584-022-03435-7	3	Based on the argument that awareness of values in the scientific process is a necessary first step to both avoid bias and attune science best to the needs of society, an analysis of the role of values in the physical climate science production process is provided. Model-based assessment of climate sensitivity is taken as an illustrative example; climate sensitivity is useful here because of its key role in climate science and relevance for policy, by having been the subject of several assessments over the past decades including a recent shift in assessment method, and because it enables insights that apply to numerous other aspects of climate science.
1	Mapping cultural ecosystem services in the hyper arid environment of south of Jordan	Albalawneh, A; Al-Assaf, A; Sweity, A; Abu Hammour, W; Kloub, K; Hjazin, A; Kabariti, R; Abu Nowar, L; Tadros, MJ; Aljaafreh, S; Diab, M; Alwidyan, J; Albashbsheh, G; Haddad, N	Frontiers in Environmental Science	2022	10.3389/fenvs.2022.866309	4	This study aimed to allocate and map the CESs in the hyper arid region at the southern part of Wadi Araba as a unique ecosystem in Jordan.
1	Addressing the vexing educational challenges of biodiversity loss: A photo-based intervention	Gehlbach, H; Mu, N; Arcot, RR; Chuter, C; Cornwall, KJ; Nehring, L; Robinson, CD; Vriesema, CC	Contemporary Educational Psychology	2022	10.1016/j.cedpsych.2022.102096	4	Focusing on the valuing component of expectancy -value theory, we evaluated the potential of photographs to affect participants' emotional reactions, valuing of biodiversity, pro-environmental behaviors, and content-relevant learning.
1	Testing the influence of visual framing on engagement and pro-environmental action	Salazar, G; Monroe, MC; Ennes, M; Jones, JA; Verissimo, D	Conservation Science and Practice	2022	10.1111/csp2.12812	4	We conducted a 6-week public experiment at the Florida Museum of Natural History in Gainesville, Florida, to test whether viewing a photography exhibit featuring images of the impacts of marine plastic pollution on ocean ecosystems (negative valence) or images of pristine ocean ecosystems (positive valence) would increase engagement, monetary donations to conservation, and pledges to help protect the ocean from plastic pollution.
4	Traditional agroecological knowledge and practices: The drivers and opportunities for adaptation actions in the northern region of Ghana,	Yeleliere, E.; Yeboah, T.; Antwi-Agyei, P.; Peprah, P.	Regional Sustainability	2022	10.1016/j.regsus.2022.11.002	4	Using a multi-scale mixed method approach, we conducted key informant interviews (n = 12), focus group discussions (n = 5), and questionnaire surveys (N = 220) to explore the traditional agroecological knowledge and practices, the influencing factors, and the opportunities smallholder farmers presented for achieving resilient agricultural systems.
4	Soil seed bank distribution and restoration potential in the vegetation of Buska Mountain range, Hamar district, southwestern Ethiopia	Bekele, M.; Demissew,S.; Bekele, T.; Woldeyes, F.	Heliyon	2022	10.1016/j.heliyon.2022.e11244	4	The study was conducted in the Buska Mountains of the Hamar area in south-western Ethiopia and determined the composition, density and vertical distribution of soil seed banks under various land-use systems and soil layers.
4	Farming systems research: Concepts, design and methodology	Behera, U.K.; France, J.	Advances in Agronomy	2022	10.1016/bs.agron.2022.08.001	4	Farming systems research (FSR) therefore involves a multidisciplinary whole-farm approach and is effective in solving the problems of smallholders and marginal farmers, dominant in Asian and other countries in the world. In this chapter, we give a holistic picture of the research methodology followed in conducting FSR globally.
4	Information constraint and farmers' willingness to pay for an irrigation scheduling tool	Martey, E.; Etwire, P.M.; Adombilla, R.; Abebrese, S. O.	Agricultural Water Management	2022	10.1016/j.agwat.2022.108043	4	This paper assesses how information on the Wetting Front Detector influences farmers' willingness to pay (WTP).
5	Electrochemical detection of selected heavy metals in water: a case study of African experiences	Okpara EC, Fayemi OE, Wojuola OB, Onwudiwe DC, Ebenso EE.	RSC Adv	2022	10.1039/d2ra02733j	4	Hence, a global campaign has been launched to ensure constant assessment of the presence of these metals in the environment and to promote awareness of dangers associated with unsafe exposure to them.
3	Community-based adaptation practices to cope with drought in the era of climate change in a rural community in Limpopo Province, South Africa	Rankoana, S.A.	Natural Resources and Sustainable Development	2022	10.31924/nrsd	4	This study examined community-based drought adaption measures in a rural community in South Africa's Limpopo Province.
3	Sorghum as a household food and livelihood security crop under climate change in South Africa: A review	Dunjana, N.; Dube, E.; Chauke, P. ; Motsepe, M.; Madikiza, S.; Kgakatsi, I.; Nciizah, A.	South African Journal of Science	2022	10.17159/sajs.2022/13340	4	Article about sorghum and is a review.
3	Disaster-Induced Resettlements: the Resilience Of Flood-Affected Households In Dar Es Salaam, Tanzania	John, R.	Geography, Environment, Sustainability	2022	10.24057/2071-9388-2021-027	4	This paper presents empirical findings on the livelihood situation of flood-resettled households in Dar es Salaam.
3	Perception and adaptation strategies of smallholder farmers to drought risk: a scientometric analysis	Ogundeji, A. A. ; Okolie, C. C.	Agriculture	2022	10.3390/agriculture12081129	4	We used the bibliometric method to analyze 121 publications from the Scopus database to better understand the existing situation and trends in the field of drought risk.

3	The Readiness Of Smallholders To Pursue The Malaysian Sustainable Palm Oil Certification For Conservation And Sustainability Initiative: A Qualitative Study In 2020	Rahmat, S.R.; Purwaningrum, F.; Salim, A.M.; Shamsurijan, M.S.; Ann, L.C.; Mohamad, M.F.B	Journal of Positive School Psychology	2022		4	The main objectives of this study are to ascertain the level of readiness for and implementation of Malaysian Sustainable Palm Oil (MSPO) by organised smallholders and participating agencies, as well as to gain an understanding of the issues confronting the palm oil industry, including the challenges posed by Climate Change and the COVID-19 pandemic.
3	Smallholders' coping strategies in response to climate variability in semi-arid agro-ecozones of Upper Eastern Kenya	Ngetich, F.K.; Mairura, F.S.; Musafiri, C.M.; Kiboi, M.N.; Shisanya, C.A.	Social Sciences & Humanities Open	2022	10.1016/j.ssaho.2022.100319	4	This study was implemented to identify the socioeconomic drivers and determinants of adaptation to rainfall variability at the farm level in contrasting agro-ecological zones of Kenya.
3	The "Sorondrano" rain ritual: perception and driving forces of actors in the face of climatic variability in southern Madagascar	Rasolondraizafy, J.F.; Ramananarivo, R.; Razafindraibe, R.; Ranaivoson, R.E.	Technium Social Sciences Journal	2022	10.47577/tssj.v36i1.7402	4	This paper aims to analyze the manifestation of the “Sorondrano” rain ritual and to assess community perceptions of its expected impacts in the face of extremely dry years over the past 38 years.
3	Floristic analysis of Medicinal Plants from the Sholas of Nilgiris, Tamil Nadu, India	Kumar, S. V.; Kingsley, J. D.; Dharani, S.; Narayanan, N.; Thejan, S.M.	Journal of Drug Delivery and Therapeutics	2022	10.22270/jddt.v12i6.5767	4	Medicinal plant documentation is a wide field of research to identify the chronicle of indigenous knowledge about plant its usage and scientifically validating the valuable species. Several field trips were carried out in Nilgiri hills between September 2021 – January 2022, covering different seasons, in order to know the phenology of the plants, Intensive and extensive field surveys was done in and around villages in Coonoor and Ooty.
3	Analysis of the challenges of climate smart agricultural practices among crop farmers in North-West, Nigeria	Ekpa, D.; Tiri, G.D.; Ekpa, M.O.	Journal of Agriculture and Environment	2022		4	This study analyses the challenges of crop farmers in using climate smart agricultural practices (CSAPs) in Katsina and Sokoto states, Northwest Nigeria to target policy effort.
6	Climate values as predictor of climate change perception in the Kingdom of Saudi Arabia	Arnout B.A.	Frontiers in Psychology	2022	10.3389/fpsyg.2022.1044697	3	This study aimed to identify and understand the nature and dynamics of public perceptions of climate change among Arab citizens and detect the level of climate change perception (CCP) and climate values (CV).
16	Good governance for sustainable blue economy in small islands: Lessons learned from the Seychelles experience	Benzaken D.; Voyer M.; Pouponneau A.; Hanich Q.	Frontiers in Political Science	2022	10.3389/fpos.2022.1040318	4	Based on a typology of “good governance” adapted from existing global typologies, we investigated the role of blue economy governance in enabling integration.
6	The Impact of Farmers’ Adaptation to Climate Change on Rice Yields: Implications for Sustainable Food Systems	Khan N.A.; Khanal U.; Wilson C.; Shah A.A.; Tariq M.A.U.R.	Sustainability (Switzerland)	2022	10.3390/su142316035	3	The household survey was conducted in the Punjab province of Pakistan, and farmers were interviewed face-to-face. We employed a simultaneous equations model to assess the differential impacts of climate change adaptation on adapting and non-adapting farmers’ rice yields.
2	Socio-economic factors influencing the adoption of low carbon technologies under rice production systems in China	Chen Z.-D.; Chen F.	Carbon Balance and Management	2022	10.1186/s13021-022-00218-6	3	Thus, the objectives of the study were to (1) investigate the public perception and preferences of LCTs in rice production of China, and (2) analyze the influences of the factors on farmer’s decision in adopting LCTs in rice production.
2	Environmental Life Cycle Assessment in Organic and Conventional Rice Farming Systems: Using a Cradle to Farm Gate Approach	Amirahmadi E.; Moudrý J.; Konvalina P.; Hörtenhuber S.J.; Ghorbani M.; Neugschwandtner R.W.; Jiang Z.; Krexner T.; Kopecký M.	Sustainability (Switzerland)	2022	10.3390/su142315870	3	The main goal of this study was to compare the environmental impacts of conventional and organic rice farming.
2	Climate change impacts and the rice farmers' responses at irrigated upstream and downstream in Indonesia	Arifah; Salman D.; Yassi A.; Bahsar-Demmallino E.	Heliyon	2022	10.1016/j.heliyon.2022.e11923	3	The focus area was in Gantarang (Figure 1), the largest rice-producing sub-district with the biggest irrigated rice fields in Bulukumba Regency
6	Reviving traditional rain-water harvesting system and artificial groundwater recharge	Laskar N.	Sadhana - Academy Proceedings in Engineering Sciences	2022	10.1007/s12046-022-02035-6	4	Article about rain-water harvesting. Rain-water harvesting system plays a major role in climate change, though it will have less impact in arid regions. It reduces the uncertainty of domestic water in arid areas, and improves internal water safety. For the proper application of a rain-water harvesting system, effective socio-political policies and community mass awareness should be put in place. rainwater pools in large storage tanks during the rainy period, which helps to reduce flooding in low soil areas. Low cost and quick depletion of artificial groundwater would help to raise the depleting layer of the water table.
2	The floods of 2022: Economic and health crisis hits Pakistan	Iqbal M.; Rabbani A.; Haq F.; Bhimani S.	Annals of Medicine and Surgery	2022	10.1016/j.amsu.2022.104800	4	Article about floods in Pakistan.
2	Knowledge of Mongolian veterinarians towards canine vector-borne diseases	Davitt C.; Traub R.; Batsukh B.; Battur B.; Pfeffer M.; Wiethoelter A.K.	One Health	2022	10.1016/j.onehlt.2022.100458	3	A hardcopy questionnaire was delivered through the Mongolian Veterinary Medical Association to a cohort of veterinarians representing 39% of Mongolia's total veterinary workforce with a 53% response rate. A total of 297 participants were included in the final study.
6	A bibliometric analysis of climate change risk perception: Hot spots, trends and improvements	Fan J.; Liu G.; Xia Z.; Cai S.	Frontiers in Environmental Science	2022	10.3389/fenvs.2022.917469	8	To provide valuable insights for understanding and summarizing the research trends and prospects on climate change risk perception, this study takes a qualitative and quantitative analysis by using bibliometric tools. This analysis presents information related to authors, countries, institutions, journals, top cited publications, research hot spots, trends, and prospects. The analysis involved 4429 articles after rigorous screening and evaluated them on the risk perception of climate change in countries and the public.
2	Reconceptualizing the Environmental History of Sixth-Century Italy and the Human-Driven Transformations of Its Landscapes	Schoolman E.M.	Studies in Late Antiquity	2022	10.1525/sla.2022.6.4.707	4	Taking two sites as case studies, a local perspective from Rieti in central Italy and a larger regional synthesis from Sicily, we see records that demonstrate the impact of different human drivers. The arrival of the Lombards and changing economic and administrative systems were the main factors in the transformation of landscapes during this period as local communities continued the management of their agricultural, pastoral, and silvicultural resources.
2	System Structure–Based Drought Disaster Risk Assessment Using Remote Sensing and Field Experiment Data	Cui Y.; Tang H.; Jin J.; Zhou Y.; Jiang S.; Chen M.	Remote Sensing	2022	10.3390/rs14225700	4	This study presented a chain transmission system structure of drought disaster risk, which meant that drought disaster loss risk R was derived from drought hazard H by the transformation of drought disaster vulnerability V.
6	Public Perceptions of Faecal Sludge Biochar and Biosolids Use in Agriculture	Nicholas H.L.; Halfacree K.H.; Mabbett I.	Sustainability (Switzerland)	2022	10.3390/su142215385	4	In this study of the public in Swansea, Wales, an online survey examines their awareness of, and comfort levels of eating food grown using biosolids, wood biochar and faecal sludge biochar. Our findings show that males were almost twice as likely than females to have a positive perception of biosolids (OR 1.91, p value 0.004) and faecal sludge biochar (OR 2.02, p value 0.03).
6	Environmental Impact Assessment of an Organic Wine Production in Central Italy: Case Study from Lazio	Vinci G.; Prencipe S.A.; Abbafati A.; Filippi M.	Sustainability (Switzerland)	2022	10.3390/su142215483	4	This study examined the environmental impact assessment of organic wine production in the Lazio region, by performing a “cradle-to-gate” approach according to the life cycle assessment (LCA) methodology.
2	Agricultural Land-Use Systems and Climate Change among Small Farmers in Sub-Saharan Africa: Relationship and Evidence of Adaptive Processes in Nigeria	Apata T.G.; Ogunleye K.; Badmus A.; Adewoyin O.; Ojo O.; Bamisaye O.; Omoju O.; Alabi O.	Sustainability and climate change	2022	10.1089/scc.2022.0081	4	This article examines land-use management and its relationship to climate change and the adaptive processes utilized by the farmers in rural Nigeria.

2	Study on the Evolution Mechanism of Ecosystem Services in Karst Mountainous Areas from the Perspective of Humanities	Miao P.; Zhao X.; Pu J.; Huang P.; Shi X.; Gu Z.	International Journal of Environmental Research and Public Health	2022	10.3390/ijerph192013628	4	Taking Guangnan County, a typical karst mountainous area in Yunnan Province, as an example, this study analyzes the evolutionary characteristics of six types of ESS and the driving mechanism of the change in ESS from the anthropogenic macro and micro perspective using questionnaire surveys and the multivariate logistic model.
2	The Status of Gillnet, Stow-Net and Trawl Fishing in the Soc Trang-Bac Lieu Coastal Region, Vietnam	Hung H.P.; Quynh V.L.K.; Van Hieu M.	Journal of Fisheries and Environment	2022		4	We investigated the species composition of fish stocks along this coastline of Vietnam, and examined the current status of fishers and the gears they use, their fish catches, and the economic returns from each of the three net types.
2	Acceptance of a sterile male releases pilot project to reduce Aedes aegypti (Linnaeus, 1762) (Diptera: Culicidae) populations and its associated factors: A community-based cross-sectional survey in South Chiapas, Mexico	Jiménez-Alejo A.; Pacheco-Soriano A.L.; Liedo P.; Marina C.F.; Bond J.G.; Rodríguez-Ramos J.C.; Valle-Mora J.; Dor A.	Acta Tropica	2022	10.1016/j.actatropica.2022.106573	4	The sterile insect technique, on the other hand, is a non-polluting and environment-friendly technique. The use of sterile insects is generally well established in agriculture, but human health interventions often require a consensus that combines social perceptions with scientific evidence. Factors associated with acceptance of the releases of sterile male Aedes aegypti mosquitoes were assessed with logistic regression models for two communities (Rio Florido and Hidalgo) in Tapachula, Chiapas, Mexico. The favourable opinion of the respondents about the project workers, and the fact that the releases of sterile mosquitoes would be managed by the Secretaría de Salud, were found to be factors that supported the acceptance of sterile mosquito releases.
2	Climate-Smart Livelihood - A Case Study of Dodaballapura Taluk of Bangalore Rural District	Sagarika M.P.; Rajeshwari U.R.	Indian Journal of Environmental Protection	2022		4	This study tries to explore the adaptation of climate smart livelihood techniques by the farmers in the Doddaballapur taluk of Bangalore rural district. T
6	Determinants of climate risk management in paddy and milled rice marketing in Nigeria	Onyeneke R.U.; Amadi M.U.; Njoku C.L.	International Journal of Global Warming	2022	10.1504/ijgw.2022.127063	3	The paper examined climate risk management in rice marketing in Ebonyi State, Nigeria using primary data from 112 paddy rice and 172 milled rice traders.
2	Green innovation in agriculture development: the impact of environment awareness, technology spillover, and social networks	Hien B.T.; Chi N.T.K.	International Journal of Sustainable Agricultural Management and Informatics	2022	10.1504/ijsami.2023.127539	4	This study proposed the relationships among environment awareness, technology spillover (TS), social networks, and green innovation. Additionally, this study also investigates moderating role of social networks on green innovation and sustainable development.
6	'I was born here, I will die here': climate change and migration decisions from coastal and insular Guinea-Bissau	Santos C.; Mourato J.M.	Geografiska Annaler, Series B: Human Geography	2022	10.1080/04353684.2022.2154689	4	This paper shows how coastal and island peoples of Guinea-Bissau continue to prefer staying put over migrating when faced with manifestations of climate change and environmental disrepair.
2	Energy–poverty–climate vulnerability nexus: an approach to sustainable development for the poorest of poor	Yadava R.N.; Sinha B.	Environment, Development and Sustainability	2022	10.1007/s10668-022-02812-7	4	The study attempted to understand and analyse the nexus between poverty, energy access and climate vulnerability of the most impoverished villages of India.
2	Smallholder farmers' perceptions of the natural and anthropogenic drivers of deforestation and forest degradation: a case study of Murehwa, Zimbabwe	Mataruse P.T.; Nyikahadzoi K.; Fallot A.	Transactions of the Royal Society of South Africa	2022	10.1080/0035919X.2022.2152507	4	The study sought to establish smallholder farmers' perceptions on the multiplicity and complexity of factors to which they attribute deforestation and forest degradation.
6	Climate change, extreme events and mental health in the Pacific region	Leal Filho W.; Krishnapillai M.; Minhas A.; Ali S.; Nagle Alverio G.; Hendy Ahmed M.S.; Naidu R.; Prasad R.R.; Bhullar N.; Sharifi A.; Nagy G.J.; Kovaleva M.	International Journal of Climate Change Strategies and Management	2022	10.1108/IJCCSM-03-2022-0032	4	This paper aims to address a gap in investigating specific impacts of climate change on mental health in the Pacific region, a region prone to extreme events.
6	Factors influencing the adoption of sustainable agricultural practices: the case of seven horticultural farms in the United Kingdom	Feliciano D.	Scottish Geographical Journal	2022	10.1080/14702541.2022.2151041	3	Seven horticultural farmers and farm managers across the UK were interviewed to investigate the implementation of sustainable practices, and the motivations and enablers for adoption, as well as perceptions on sustainability and climate change. Factors influencing adoption mainly were efficiency and cost reduction, regulations, and market demand, even though, environmental, and social consciousness also played a role in adoption.
2	Perception of and adaptation to climate change: the case of wheat farmers in northwest Bangladesh	Tasnim Z.; Saha S.M.; Hossain M.E.; Khan M.A.	Environmental Science and Pollution Research	2022	10.1007/s11356-022-24478-4	3	Therefore, two northwestern districts, Dina jpur and Thakurgaon, were selected purposively since they hold a signifcant share (18.89%) in the national wheat pro duction (BBS 2020). Then, Birganj Upazila (sub-district) from Dinajpur and Thakurgaon Sadar and Pirganj Upazila from Thakurgaon were selected based on the production of wheat (Fig. 1).
2	Quantifying households' vulnerability, regional environmental indicators, and climate change mitigation by using a combination of vulnerability frameworks	Fahad S.; Su F.; Wei K.	Land Degradation and Development	2022	10.1002/ldr.4501	4	Article about vulnerability.
16	Integrated Participatory Approach Reveals Perceived Local Availability of Wild Edible Plants in Northwestern Kenya	Oluoch W.A.; Whitney C.W.; Termote C.; Borgemeister C.; Schmitt C.B.	Human Ecology	2022	10.1007/s10745-022-00370-0	4	We used an integrated participatory approach to investigate important parameters and themes that influenced the perception of availability of woody WEPs.
16	Climate change manifestations and adaptations in cocoa farms: Perspectives of smallholder farmers in the Adansi South District, Ghana	Anning A.K.; Ofori-Yeboah A.; Baffour-Ata F.; Owusu G.	Current Research in Environmental Sustainability	2022	10.1016/j.crsust.2022.100196	3	Cocoa is the principal agricultural export and the chief cash crop in Ghana (Aneani et al., 2011), and global production and export levels are second only to Cote d'Ivoire (Wessel and Quist-Wessel, 2015). The cocoa industry contributes significantly to the Ghanaian economy, as it employs approximately 800,000 farm families and generates over $2 billion annually through the foreign exchange of export crops (Nunoo et al., 2015). The country's cocoa production is recognized in the developing world as one of the most modeled commodities and valuables that drive economic growth and poverty alleviation (Breisinger et al., 2008; Wessel and Quist-Wessel, 2015).
2	Reanimating the strangled rivers of Aotearoa New Zealand	Brierley G.J.; Hikuroa D.; Fuller I.C.; Tunnicliffe J.; Allen K.; Brasington J.; Friedrich H.; Hoyle J.; Measures R.	Wiley Interdisciplinary Reviews: Water	2022	10.1002/wat2.1624	4	This article outlines a biophysical prioritization framework to support the development and roll out of space-to-move interventions in ways that work with the character, behavior, condition, and evolutionary trajectory (recovery potential) of each river system in Aotearoa. This article is categorized under: Water and Life > Conservation, Management, and Awareness Science of Water > Water and Environmental Change.
1	The influence of peer effects on farmers' response to climate change: evidence from Sichuan Province, China	Ma, JQ; Zhou, WF; Guo, SL; Deng, X; Song, JH; Xu, DD	Climatic Change	2022	10.1007/s10584-022-03463-3	4	Using survey data of 540 farmers from Sichuan Province, the binary probit model and propensity score matching (PSM) method were used to analyze the peer effects on farmers' response to climate change.

1	On the wrong track: Sustainable and low-emission blue food diets to mitigate climate change	Atalah, J; Sanchez-Jerez, P	Frontiers in Sustainable Food Systems	2022	10.3389/fsufs.2022.994840	4	Using published studies, we estimated greenhouse gases, nitrogen, and phosphorus emissions to assess trends in environmental footprint. Low performance was associated with the consumption of high trophic-level species intensively farmed in distant regions, such as carnivorous fish, due to high stressor emissions related to their production and transport.
1	Smallholder farmers' perceptions of and adaptations to water scarcity in an irrigated system in Chiapas, Mexico	Leroy, D; Bocco, G; Garcia, SB	International Journal of Water Resources Development	2022	10.1080/07900627.2022.2142203	4	This paper explores smallholder farmers' perceptions of and adap tations to water scarcity in an irrigated system in south-eastern Mexico.
1	How Will the Global Food Landscape Accommodate Developing Countries' Dietary Change under Urbanization?	Zhang, YL; Li, SY; Jin, L; Wu, F	Foods	2022	10.3390/foods11223598	4	Our study aims to use the GTAP (Global Trade Analysis Project) model to predict the future food landscape based on the dietary shift in developing countries, represented by China, India, Bangladesh, and Myanmar, under a 2030 urbanization scenario.
1	'Natural born carers'? Reconstituting gender identity in the labour of calf care	Enticott, G; O'Mahony, K; Shortall, O; Sutherland, LA	Journal of Rural Studies	2022	10.1016/j.jrurstud.2022.09.034	4	Focusing on the careers and labour of calf rearers, the paper shows how calf rearing identities are structured and contested, and linked to cultures of care that are shaped by patriarchal farming relations.
1	Assessing psychological factors on farmers' intention to apply organic manure: an application of extended theory of planned behavior	Li, J; Jiang, R; Tang, XY	Environment Development and Sustainability	2022	10.1007/s10668-022-02829-y	4	Different from the previous studies on social and economic impacts, this study focused on the assessment of psychological factors on farmers' application of organic manure. We explored the psychological evaluation based on the extended theory of planned behavior (TPB), which consists of attitude (AT), perceived behavior control (PBC), subjective norm, moral norm (MN), environmental risk perception (ERP), and perceived policy effectiveness (PPE). Further, we explored the moderating effects of PPE. We studied 235 tea growers in China to verify the model and analyzed the psychological factors in their decisions regarding organic manure application.
1	Do Rainfall Shocks Prompt Commercial Input Purchases Amongst Smallholder Farmers in Diverse Regions and Environments in Malawi?	Makate, C; Makate, M	Sustainability	2022	10.3390/su142214904	3	This paper investigates whether climate shocks, particularly rainfall shocks, influence commercial input purchase decisions by smallholder farmers in contrasting geographic regions in Malawi, with a particular emphasis on fertilizer, agrochemicals, seed, and labor.
3	North American Indigenous Perceptions of the Apocalypse and a Renewal of Kinship Relationships through the Imagination	Mussi, F.	Between	2022	10.13125/2039-6597/5158	4	Focusing on the Canadian Indigenous context, first, I discuss the settler-colonial implications of environmental apocalypse, arguing that Indigenous peoples are already living in a post-apocalyptic condition. Secondly, I explore the Indian Residential School policy as an example of how settler-colonialism contributed to creating the post-apocalyptic situation with which Indigenous peoples live today. Thirdly, through analysis of Lee Maracle's "The Void" and Daniel H. Justice's "The Boys Who Became the Hummingbirds", I discuss how both stories employ imagination to place environmental disasters in conversation with settler-colonial practices, thus re-shaping understandings of the past, present, and future.
3	A framework for systemic sustainable construction industry development (SSCID). Discover Sustainability, 2(1), pp.1-21.	Gyadu-Asiedu, W.; Ampadu-Asiamah, A.; Fokuo-Kusi, A.	Discover Sustainability	2022	10.1007/s43621-021-00033-y	4	The study aimed to provide a framework by which the construction industry development agenda in developing countries could be prosecuted through a more structured and systemic approach.
3	Climate change vulnerability and smallholder farmers' adaptive responses in the semi-arid Far North Region of Cameroon.	Njoya, H.M.; Matavel, C.E.; Msangi, H.A.; Wouapi, H.A.N., Löhr, K.; Sieber, S.	Discover Sustainability	2022	10.1007/s43621-022-00106-6	4	This research examines how farmers perceive their vulnerability and how they respond to climate change in the semi-arid Far North Region of Cameroon.
3	The Suffering of Indigenous Communities: Environmental Racism in Cherie Dimaline's The Marrow Thieves	Amanolahi, A.	Satura	2022	10.17879/satura-2022-4527	4	Climate change and racism, both inextricably intertwined, are two of the biggest challenges of this century. Evidence of heightened exposure to environmental hazards in communities of color and their unreasonable exposure to air pollution is mounting, according to an essay by American emergency medicine physician Renée Salas, published in The New England Journal of Medicine. These facts undergird the concept of "environmental racism" – a notion long regarded as a fringe issue that has now clawed its way back into the limelight, thanks to growing awareness of both climate change and racism.
3	Sámi Early Childhood Education and Sustainability in the Arctic	Laiti, M.; Määttä, K.; Kõngäs, M.	International Journal of Research in Education and Science	2022	10.46328/ijres.2974	4	The purpose of this article is to describe Arctic sustainable Sámi early childhood education based on the perceptions and experiences of Sámi early childhood educators in Finland.
3	Implementing Nature's Rights in Colombia: The Atrato and Amazon Experiences. Revista Derecho del Estado, (54).	Richardson, W.; Bustos, C.	Revista Derecho del Estado	2022	10.18601/01229893.n54.08.	4	Este estudio examina los dos enfoques fundamentales de los derechos de la naturaleza ordenados por los tribunales de Colombia que reconocen los ecosistemas, la cuenca del río Atrato (2016) y la Amazonía colombiana (2018), como un sujeto legal con derechos de protección, mantenimiento, conservación y restauración.
3	Factors Affecting Adoption of Climate Change Adaptation Strategies by Small Holder Farmers in Mountain and Lowland Agro-ecological Zones of Eastern Uganda	Mulabbi, A.; Turyahabwe, R.;Turybanawe, L.G.;Asaba, J.; Mukisa, G.	In Forum Geografi	2022	10.23917/forgeo.v36i2.16231	4	This study assessed the factors affecting adoption of climate change resilience strategies in Muyembe sub-county, Bulambuli district, Uganda.
10	Uptake of Climate Smart Agriculture in Peri-Urban Areas of South Africa's Economic Hub Requires Up-Scaling	Chitakira, M.; Ngcobo, N.Z.P.	Frontiers in Sustainable Food Systems	2021	10.3389/fsufs.2021.706738	6	The present study aimed to assess the extent to which agricultural activities by smallholder crop farmers in the City of Tshwane Metropolitan Municipality in Gauteng province of South Africa are climate smart, and to establish the sustainable measures to be put in place to enhance the adoption of climate smart agriculture.
16	Building Climate Resilience in Rainfed Landscapes Needs More Than Good Will	Barron, J.; Skyllerstedt, S.; Giordano, M.; Adimassu, Z.	Frontiers in Climate	2021	10.3389/fclim.2021.735880	4	This paper aims to bridge theory and practice by coupling research on resilience with its application in the international development field. We present a resilience framework with indicators to assess the extent of community resilience to climate change through improved local agricultural production and natural resources management. Primary and secondary landscape and community data, together with development of participatory watershed action plans were used to populate 16 indicators in a resilience framework baseline for the two rainfed dominated watersheds in Ethiopia and Ghana.
6	Analysis of agriculturally relevant rainfall characteristics in a tropical highland region: An agroecosystem perspective	Ademe D.; Zaitchik B.F; Tesfaye K.; Simane B.; Alemayehu G.; Adgo E.	Agricultural and Forest Meteorology	2021	10.1016/j.agrformet.2021.108697	4	This study examined recent (1981-2016) OD, CD, and LGP variability and trends for the main rainy season in different agroecosystems (AESs) in the northwestern Ethiopian Highlands. Onset criteria were derived from surveys, rainfall data, and previous literature whereas cessation criteria were set from the soil water holding capacity (WHC), daily reference evapotranspiration (ETo), and daily rainfall in each site.
6	Lessons learned about the importance of raising risk awareness in the Mediterranean region (north Morocco and west Sardinia, Italy)	Ivčević, A.; Mazurek, H.; Siame, L.; Bertoldo R.; Statzu V.; Agharroud K.; Estrela Rego, I.; Mukherjee, N.; Bellier, O.	Natural Hazards and Earth System Sciences	2021	10.5194/nhess-21-3749-2021	6	Location: south coast (north Morocco) and the north coast (the Italian island of Sardinia)
2	Dynamic modelling shows substantial contribution of ecosystem restoration to climate change mitigation	Littleton, E.W.; Dooley, K.; Webb, G.; Harper A.B.; Powell T.; Nicholls Z.; Meinshausen, M.; Lenton, T.M.	Environmental Research Letters	2021	10.1088/1748-9326/ac3c6c	4	This study provides spatially explicit estimates of ecosystem restoration potential quantified with a Dynamic Global Vegetation Model. Simulations covering forest restoration, reforestation, reduced harvest, agroforestry and silvopasture were combined.

2	Corn Leaf Disease Detection with Pertinent Feature Selection Model Using Machine Learning Technique with Efficient Spot Tagging Model	Noola, D.A.; Basavaraju, D.R.	Revue d'Intelligence Artificielle	2021	10.18280/ria.350605	4	Applying image processing and machine learning methodologies, this research offers an efficient Spot Tagging Leaf Disease Detection with Pertinent Feature Selection Model using Machine Learning Technique (SPLDPFS-MLT).
19	Gendered perceptions and adaptation practices of smallholder cocoa farmers to climate variability in the Central Region of Ghana	Jamal, A.M.; Antwi-Agyei, P.; Baffour-Ata, F.; Nkiaka E.; Antwi, K.; Gbordzor, A.	Environmental Challenges	2021	10.1016/j.envc.2021.100293	3	Three communities namely Breman Ayipey, Breman Kun- tanase and Breman Baako were purposively selected for field data collection after consulting some of the Agricultural Extension Offi- cers in the district. These communities were selected due to their inten- sive cocoa farming activities.
6	An agro-based society after post-industrial society: From a perspective of economic growth paradigm	Han, H.; Xia, S.	Social Sciences	2021	10.3390/socsci10120455	4	Article is about the industrial "Anthropocene", agro-based society and post-industrial.
10	Factors influencing the adoption of climate-smart irrigation technologies for sustainable crop productivity by smallholder farmers in arid areas of South Africa	Serote, B.; Mokgehle, S.; Plooy, C.D.; Mpandeli, S.; Nhamo, L.; Senyolo, G.	Agriculture (Switzerland)	2021	10.3390/agriculture11121222	4	This study identified the factors influencing smallholder farmers' decision to adopt Climate Smart Irrigation Technologies (CSIT) in the Limpopo Province of South Africa.
6	Threat ranking to improve conservation planning: An example from the gediz delta, Turkey	Arslan, D.; Çiçek, K.; Döndüren, Ö.; Ernoul, L.	Land	2021	10.3390/land10121381	4	Mediterranean wetlands are among the most threatened natural areas. In this case study, we evaluated current threats in the Gediz Delta (Turkey) using a multi-method approach. First, we did a comprehensive literature review and stakeholder interviews to identify existing threats. We then did a complete survey of the Delta through intensive fieldwork. The threats were coded and ranked using the conservation standards.
6	Vulnerability and adaptation to flood hazards in rural settlements of limpopo province, South Africa	Munyai, R.B.; Chikoore, H.; Musyoki, A.; Chakwizira J.;Muofhe T.P.; Xulu, N.G.; Manyanya, T.C.	Water (Switzerland)	2021	10.3390/w13243490	4	This study examined flood vulnerability in three rural villages in South Africa's northern Limpopo Province and how communities are building resilience and coping with the hazard.
11	Climate change impacts on household food security and farmers adaptation strategies	Mekonnen, A.; Tessema, A.; Ganewo, Z.; Haile, A.	Journal of Agriculture and Food Research	2021	10.1016/j.jafr.2021.100197	4	We therefore analyzed local climatic changes, the status of household food security, climate-related causes of food insecurity, food security determinants and the adaptation strategies of local farmers. Three decades meteorological data were analyzed. A total of 185 farmers were selected using simple random sampling and interviewed, together with focus groups.
6	Changing ground: Handling tensions between production ethics and environmental ethics of agricultural soils	van Mansvelt, J.D.; Struik, P.C.; Bos, A.; Daub W.; Sprangers D.; van den Berg, M.; Vingerhoets, M.; Zoeteman, K.	Sustainability (Switzerland)	2021	10.3390/su132313291	4	This study argues for soil protection based on the concept of soil telos defined as the combined purposefulness in agricultural production and terrestrial ecosystem optimization.
6	An assessment of flood event along Lower Niger using Sentinel-1 imagery	Adedeji, O.; Olusola, A.; Babamaaji, R.; Adelabu, S.	Environmental Monitoring and Assessment	2021	10.1007/s10661-021-09647-1	4	This study is aimed at assessing the 2018 flood event in Lokoja, Kogi State, Nigeria, using the Sentinel-1 imagery. The study confirmed that a total of 69 buildings out of 611 buildings were affected by the flood disaster with about 24,902 people displaced by this singular flood event.
6	Climate Change Adaptation (CCA) Interventions and Indicators in Nepal: Implications for Sustainable Adaptation	Karki, G.; Bhatta, B.; Devkota, N.R.; Acharya, R.P.; Kunwar, R.M.	Sustainability (Switzerland)	2021	10.3390/su132313195	4	We reviewed 76 climate change adaptation projects that were operational between 2010 and 2020. The review was followed by office and field visits for verification. The office visit helped crosscheck the findings, and the field observations carried out between December 2020 and April 2021 asked 24 key informants and collected supplementary information appraisal and indicator development.
6	Food and consumer attitude(S): An overview of the most relevant documents	Martinho, V.J.P.D.	Agriculture (Switzerland)	2021	10.3390/agriculture11121183	4	The main objective of this research is to suggest an alternative approach for carrying out systematic reviews based on bibliometric analysis and to implement it in topics about food and consumer attitudes.
6	Rainfall anomalies and their impacts on Bhutan's agro-ecological landscape	Chhogyel, N.; Kumar, L., Bajgai, Y.	Regional Environmental Change	2021	10.1007/s10113-021-01851-6	3	It presents data on perceptions of agriculture in Bhutan on variations in rainfall. It doesn't say if it's smallholders, moreover, Paro is a city in Bhutan.
6	Exploring barriers to agroforestry adoption by cocoa farmers in south-western Côte d'Ivoire	Kouassi, J.-L.; Kouassi, A.; Bene, Y.; Konan D.; Tondoh, E.J.; Kouame, C.	Sustainability (Switzerland)	2021	10.3390/su132313075	3	This study was carried out in southwest Côte d'Ivoire through a household survey to assess the willingness of cocoa farmers to adopt cocoa agroforestry.
6	Planning for pandemic resilience: COVID-19 experience from urban slums in Khulna, Bangladesh	Akter, S.; Hakim, S.S.; Rahman, M.S.	Journal of Urban Management	2021	10.1016/j.jum.2021.08.003	3	Results are based on existing NGO BRAC dataset and fieldwork between April and August 2020 in 29 slums in Khulna, Bangladesh.
2	Sustainable developmentality: Interrogating the sustainability gaze and the cultivation of mountain subjectivities in the central Indian Himalayas	Orchard, S.	Geoforum	2021	10.1016/j.geoforum.2021.11.004	4	This paper interrogates the 'sustainability gaze' of external experts – which reflects attempts to reconcile neoliberal economic growth with environmental conservation within the logics of technical and biophysical rationalities - by exploring local experiences of rapid and uncertain social and environmental change.
10	Oceanian Sovereignty: Rethinking conservation in a sea of islands	Bambridge, T.; D'Arcy, P.; Mawyer, A.	Pacific Conservation Biology	2021	10.1071/PC20026	4	This article draws on the transformative work of Tongan anthropologist and political philosopher Epeli Hau'ofa to articulate characteristics of an Oceanian Sovereignty that illuminate ongoing conceptual shifts around conservation in this region.
6	Conservation agriculture in new alluvial agro-ecology: Differential perception and adoption	Chatterjee R.; Acharya S.K.; Biswas A.; Mandal A.; Biswas T.; Das S.; Mandal B.	Journal of Rural Studies	2021	10.1016/j.jrurstud.2021.10.001	4	Accordingly, this article seeks to provide an understanding of such nuances in new alluvial context, along with empirical insights on factors influencing CA adoption, as well as the interaction among the agroecological, socio-economic, and communication variables and inclination toward adoption.
6	Advancements of nanotechnologies in crop promotion and soil fertility: Benefits, life cycle assessment, and legislation policies	Younis, S.A.; Kim, K.-H.; Shaheen, S.M.; Antoniadis V.; Tsang Y.F.; Rinklebe J.; Deep, A.; Brown, R.J.C.	Renewable and Sustainable Energy Reviews	2021	10.1016/j.rser.2021.111686	4	Nanotechnology article.
6	Modelling stakeholder perceptions to assess Green Infrastructures potential in agriculture through fuzzy logic: A tool for participatory governance	Schiavon, E.; Taramelli, A.; Tornato, A.	Environmental Development	2021	10.1016/j.envdev.2021.100671	4	The article aims to assess stakeholder perceptions on the implementation of Green Infrastructures in agriculture, capturing critical barriers and enablers.
6	A mixed method study on global warming, climate change and the role of public health nurses from the perspective of nursing students	Ergin, E.; Altinel, B.; Aktas, E.	Nurse Education Today	2021	10.1016/j.nedt.2021.105144	3	Study with 154 nursing students to assess the knowledge and awareness of nursing students in the Central Anatolia region about global warming, climate change, the impact on health and the role of the public health nurse.

2	Soil carbon stock and stability under Eucalyptus-based silvopasture and other land-use systems in the Cerrado biodiversity hotspot	Pinheiro, F.M.; Nair, P.K.R.; Nair, V.D.; Tonucci, R.G.; Venturin, R.P.	Journal of Environmental Management	2021	10.1016/j.jenvman.2021.113676	4	Study on carbon in three aggregate size classes in six land use systems in Latosols in Minas Gerais, Brazil. The systems were planted forest, native secondary forest, managed pasture and three 8-year-old commercial silvopastoral systems, differing in their tree planting configurations.
27	Uses, abundance perception, and potential geographical distribution of Smilax aristolochiifolia Mill (SMILACACEAE) on the Totonacapan Region of Puebla, Mexico	Espinoza-Pérez, J.; Reyes, C.; Hernández-Ruíz, J.; Díaz-Bautista M.; Ramos-López F.; Espinoza-Gómez, A.; Pérez-García, O.	Journal of Ethnobiology and Ethnomedicine	2021	10.1186/s13002-021-00477-6	4	Interviews with 260 people in 13 localities in the north of the Serra do Estado de Puebla, about a plant species, frequency of consumption of the species, perception of its abundance and distribution, reasons or arguments presented by the Totonac indigenous population about the decrease in the presence of specimens of S. aristolochiifolia, its collection dates and cut prices of kgentsililh at the community level and in local markets.
2	Who will benefit from big data? Farmers' perspective on willingness to share farm data	Zhang, A.; Heath, R.; McRobert, K.; Llewellyn R.; Sanderson J.; Wiseman, L.; Rainbow, R.	Journal of Rural Studies	2021	10.1016/j.jrurstud.2021.08.006	3	The present study aimed to investigate farmers' perspective on who would benefit most from aggregated farm data and their willingness to share their input and output farm data with a range of agricultural sector stakeholders (i.e. other farmers, industry and government statistics, technology companies and research institutions). To do this, we conducted a computer-assisted telephone interview with 880 Australian farmers in the broadacre agricultural sectors.
26	Determinants of choice of climate change adaptation practices by smallholder pineapple farmers in the semi-deciduous forest zone of Ghana	Antwi-Agyei, P.; Wiafe, E.A.; Amanor, K.; Baffour-Ata, F.; Codjoe, S.N.A.	Environmental and Sustainability Indicators	2021	10.1016/j.indic.2021.100140	3	This paper explored the extent to which the awareness of climate change affects the choice of climate change adaptation practice by smallholder pineapple farmers. Farming is the key occupation for many in this municipality, especially those in rural areas. The municipality is best known for its production of pineapples in larger quantities for export.
2	Effects of diurnal temperature range on cardiovascular disease hospital admissions in farmers in China's Western suburbs	Zha, Q.; Chai, G.; Zhang, Z.-G.; Sha, Y.; Su, Y.	Environmental Science and Pollution Research	2021	10.1007/s11356-021-15459-0	6	This is the first study to evaluate the short-term effect of DTR on CVD hospital admission in suburban farmers, as well as to identify vulnerable subpopulations.
6	Quantifying climate-induced drought risk to livelihood and mitigation actions in Balochistan	Ashraf, M.; Arshad, A.; Patel, P.M.; Khan A.; Qamar H.; Siti-Sundari R.; Ghani M.U.; Amin, A.; Babar, J.R.	Natural Hazards	2021	10.1007/s11069-021-04913-4	4	This article aims to quantify two key components of the risk of climate change induced disasters through (1) analysis of agrometeorological data (1981-2017) with exploratory data analysis and Mann-Kendall trend analysis; (2) extensive field survey (200 households)
6	Comparative analysis of the social vulnerability assessment to climate change applied to fisheries from Spain and Turkey	Gómez Murciano, M.; Liu, Y.; Ünal, V.; Sánchez LIzaso, J.L.	Scientific Reports	2021	10.1038/s41598-021-93165-0	6	Location: Castelló (Spain) and the Aegean Sea (Turkey).
6	Spatial cost–benefit analysis of blue restoration and factors driving net benefits globally	Stewart-Sinclair, P.J.; Klein, C.J.; Bateman, I.J.; Lovelock, C.E.	Conservation Biology	2021	10.1111/cobi.13742	3	We conducted a global cost–benefit analysis to determine the net benefits of restoring coral reef, mangrove, saltmarsh, and seagrass ecosystems, where the benefit is defined as the monetary value of ecosystem services.
16	Agricultural insurance access and acceptability: examining the case of smallholder farmers in Ghana	Ankrah, D.A.; Kwapong, N.A.; Eghan, D.; Adarkwah, F.; Boateng-Gyambiby, D.	Agriculture and Food Security	2021	10.1186/s40066-021-00292-y	4	This study investigated the access and acceptability of agricultural insurance among smallholder food crop farmers in Ghana.
10	Extension Agents' Perception on Suitability of Climate Change Information Disseminated to Smallholder Farmers	Zikhali, Z.M.; Mafongoya, P.L.; Mudhara, M.; Jiri, O.; Mudaniso, B.	Journal of Asian and African Studies	2021	10.1177/00219096211004642	3	This study examined gaps in climate information within public agricultural extension in Limpopo Province, South Africa. It assessed extension officers' climate change perceptions, knowledge and climate education.
6	Conservation status revision and communities' perceptions of 22 Aloe species in Tanzania	Abihudi, S.A.; de Boer, H.J.; Treydte, A.C.	Plant Ecology and Evolution	2021	10.5091/PLECEVO.2021.1838	4	Study about Aloe species.
2	Private groundwater management and risk awareness: A cross-sectional analysis of two age-related subsets in the Republic of Ireland	Mooney, S.; O'Dwyer, J.; Hynds, P.D.	Science of the Total Environment	2021	10.1016/j.scitotenv.2021.148844	3	Study about awareness and well maintenance in high groundwater-reliant regions such as the Republic of Ireland.
2	Temporal and spatial distribution of health, labor, and crop benefits of climate change mitigation in the United States	Shindell, D.; Ru, M.; Zhang, Y.; Seltzer K.; Faluvegi G.; Nazarenko L.; Schmidt G.A.; Parsons L.; Challapalli A.; Yang, L.; Glick, A.	Proceedings of the National Academy of Sciences of the United States of America	2021	10.1073/pnas.2104061118	4	We examine the US impacts of emission changes on several factors that are affected by both climate and air quality responses.
6	Climate Change in Fisheries and Aquaculture: Analysis of the Impact Caused by Idai and Kenneth Cyclones in Mozambique	Muhala, V.; Chicombo, T.F.; Macate, I.E.; Guimarães-Costa A.; Gundana H.; Malichocho C.; Hasimuna O.J.; Remédio A.; Maulu S.; Cuamba L.; Bessa-Silva, A.R.; Sampaio, I.	Frontiers in Sustainable Food Systems	2021	10.3389/fsufs.2021.714187	6	The aim of the present study was to investigate the impacts these cyclones had on fisheries and aquaculture in the provinces of Sofala and Zambézia in Mozambique. The study further seeks to propose strategies that could be adopted by the communities to minimize the risks in the future.
6	Dryland Watershed Restoration With Rock Detention Structures: A Nature-based Solution to Mitigate Drought, Erosion, Flooding, and Atmospheric Carbon	Gooden, J.; Pritzlaff, R.	Frontiers in Environmental Science	2021	10.3389/fenvs.2021.679189	4	In this study, we analyze watershed-scale installation of rock detention structures (RDS) as a nature-based solution for climate change mitigation and adaptation. Case studies include four properties that offer examples of structures that have been in place over a period ranging from 1 to 40 years.
2	Neglected crops of Africa	Okigbo, R.N.; Ugwu, C.S.	International Journal of Agricultural Technology	2021		4	Study (report) about plant species used for food, fiber, fodder, oil or medicinal purposes. They include Bambara groundnut (Vigna subterranean (L.) Verdc.), Fonio (Digitaria exilis (Kippist), Soursop (Annona muricata (L), Finger millet (Eleusine coracana (L.) and Ziziphus mauritiana (Lam.). In Africa, many plant species are underutilized.
6	Farmers' perceptions on climate change and adaptation strategies in Yendi Municipality, Ghana	Adanu, S.K.; Abole, T.; Gbedemah, S.F.	Future of Food: Journal on Food, Agriculture and Society	2021	10.17170/kobra-202110144892	6	The objectives of this study were to find out what farmers perceive as climate change, what they consider as the causes of the change, and how they adapt to climate change. Methods used for collecting data were administering questionnaires to farmers in six towns in the Yendi Municipality.

6	A Holistic Framework towards Developing a Climate-Smart Agri-Food System in the Middle East and North Africa: A Regional Dialogue and Synthesis	Govind, A.; Wery, J.; Dessalegn, B.; Elmahdi A.; Bishaw Z.; Nangia V.; Biradar C.; Nisa Z.U.; Abay K.; Amarnath G; Breisinger C.; Ibrahim N.A.; Niane, A.A.; Thijssen, M.	Agronomy	2021	10.3390/AGRONOMY11112351	3	In the study, we hypothesized that "Climate-Smart Lifts" implemented in the enabling environments can rapidly facilitate agri-food transformation in the region. In order to gather the stakeholders' perception about this, we organized a collective conversation among ~400 stakeholders that represent various scales and sectors within the agriculture sector in Middle East and North Africa (MENA).
6	Climate change perception and uptake of climate-smart agriculture in rice production in ebonyi state, nigeria	Onyeneke, R.U.; Amadi, M.U.; Njoku, C.L.; Osuji, E.E.	Atmosphere	2021	10.3390/atmos12111503	2	The paper therefore examined climate change perception and uptake of climate-smart agriculture in rice production in Ebonyi State, Nigeria using cross-sectional data from 347 rice farmers in an important rice-producing area in Nigeria.
2	Dynamic assessment of the flood risk at basin scale under simulation of land-use scenarios and spatialization technology of factor	Liu, J.; Wang, J.; Xiong, J.; Cheng W.; Cui X.; He W.; He Y.; Duan Y.; Yang, G.; Wang, N.	Water (Switzerland)	2021	10.3390/w13223239	4	This study elaborated a new framework for a basin scale that employs a future land-use simulation model, a factor spatialization technique, and a novel hybrid model for scenario-based flood risk assessment in 2030 and 2050.
6	Influence analysis of sustainability perceptions on sense of community and support for sustainable community development in relocated communities	Lin, Y.-H.; Lee, T.-H.; Wang, C.-K.	International Journal of Environmental Research and Public Health	2021	10.3390/ijerph182212223	4	Assesses the perception of indigenous peoples on support for sustainable community development and other issues.
2	Climate change concerns of saudi arabian farmers: The drivers and their role in perceived capacity building needs for adaptation	Alotaibi, B.A.; Abbas, A.; Ullah, R.; Nayak R.K.; Azeem, M.I.; Kassem, H.S.	Sustainability (Switzerland)	2021	10.3390/su132212677	3	This work was undertaken to evaluate farmers' level of concern about climate change in the Jazan province of Saudi Arabia. Jazan Province is located in the southwest of Saudi Arabia and it is second smallest province of the country.
26	The effect of smallholder maize farmers' perceptions of climate change on their adaptation strategies: the case of two agro-ecological zones in Ghana	Aidoo, D.C.; Boateng, S.D.; Freeman, C.K.; Anaglo, J.N.	Heliyon	2021	10.1016/j.heliyon.2021.e08307	3	This study examined how the perceptions of maize farmers regarding climate change affect their choice of adaptation strategies. Maize is one of the most common cereals and a major staple that is cultivated across all agro-ecological zones in Ghana.
6	Climate change mitigation on tropical peatlands: A triple burden for smallholder farmers in Indonesia	Merten, J.; Nielsen, J.Ø.; Rosyani; Faust, H.	Global Environmental Change	2021	10.1016/j.gloenvcha.2021.102388	4	The study presents insights about the impacts and climate mitigation efforts evoke in local communities living in and around peatlands. We present insights on this from Sumatra, Indonesia and use a climate justice lens to evaluate local outcomes.
6	Farmers' awareness in the context of climate change: An underutilized way for ensuring sustainable farmland adaptation and surface water quality	Awad, A.; Luo, W.; Al-Ansari, N.; Elbeltagi A.; El-Rawy M.; Farres, H.N.; Gabr, M.E.-S.	Sustainability (Switzerland)	2021	10.3390/su132111802	4	Study about simulations using the Crop Water and Irrigation Requirements model (CROPWAT), over the period from 2026 to 2050 in the Yanyun irrigation district, Yangzhou, China.
6	Contribution of the adjusted empirical analysis of the RSULE and FAO models in the estimation of soil losses in the watershed of Wadi El Hayat (Saudi Arabia)	Azaiez, N.; Baazaoui, N.; Blel, I.F.; Hammami, B.S.	Arabian Journal of Geosciences	2021	10.1007/s12517-021-08561-7	4	The study is about the problem of water erosion. Land degradation and the environmental effects that could result from it remain among the main challenges for "Assirian" peasant society.
6	Climate-adapted, traditional or cottage-garden planting? Public perceptions, values and socio-cultural drivers in a designed garden setting	Hoyle, H.E.	Urban Forestry and Urban Greening	2021	10.1016/j.ufug.2021.127362	6	Recent UK research has revealed public support for climate-adapted urban green infrastructure (UGI), yet there is a lack of research focusing on the values underlying public perceptions, particularly in relation to climate change, and the socio-cultural factors driving these. This was addressed by asking 249 people to walk through one of three contrasting areas of planting: exotic (climate-adapted); traditional or cottage-garden, within a designed garden setting, whilst conducting a self-guided questionnaire assessing participants' perceptions of aesthetics, self-reported restorative effect, and plant and invertebrate biodiversity.
6	Climate change in rural Pakistan: evidence and experiences from a people-centered perspective	Ajani, A.; van der Geest, K.	Sustainability Science	2021	10.1007/s11625-021-01036-4	3	Isn't specific about small-scale populations.
6	Climatic change and climatic variability: An objective decomposition	Grove, M.	Quaternary Science Reviews	2021	10.1016/j.quascirev.2021.107196	4	It is suggested that white noise, due to its inherent unpredictability, provides a theoretically robust model of variability that accords with perceptions of variability conveyed by the existing literature. The use of white noise as a model for variability enables the development of an algorithm that objectively decomposes an empirical climatic signal into change and variability components.
12	Perspectives of climate change: A comparison of scientific understanding and local interpretations by different Western Siberian communities	Rakhmanova, L.; Kolesnichenko, L.; Kuzhevskaya, I.; Kolesnichenko I.; Vorobev R.; Tyulyupo S.; Drozdov, V.; Shaduyko, O.	Ambio	2021	10.1007/s13280-021-01621-y	6	We present a study of social effects of climate change as experienced by local communities, based on field research and analysis in Western Siberia, from southern taiga to tundra. The city of Tomsk was selected as a an example of an urban area with well-developed infrastructure to compare the perceptions of climate change between urban and rural populations.
2	Connecting biodiversity and human dimensions through ecosystem services: The Numto Nature Park in West Siberia	Minayeva, T.Y.; Filippov, I.V.; Tysiachniouk, M.S.; Markina A.V.; Kiselev S.B.; Lapshina, E.D.; Sirin, A.A.	Ambio	2021	10.1007/s13280-021-01625-8	4	An assessment of the socio-ecological system of the Nature Park "Numto" in West Siberia was carried out based on ecosystem services (ES) mapping.
6	A social resilience measurement tool for Tanzania's water supply systems	Sweya, L.N.; Wilkinson, S.; Kassenga, G.	International Journal of Disaster Risk Reduction	2021	10.1016/j.ijdrr.2021.102558	4	The current study assisted with a review of existing frameworks, proposes a social resilience measurement tool that was made relevant to Tanzania through pre-assessment, pre-testing, and a three-round Delphi process.
6	An assessment of factors influencing awareness, access and use of agro-climate services among farmers in Clarendon, Jamaica	Fay Buckland, S.; Campbell, D.	Geoforum	2021	10.1016/j.geoforum.2021.07.032	6	Location: Claredon, jamaica.
6	Vulnerability drivers for small pelagics and milkfish aquaculture value chain determined through online participatory approach	Macusi, E.D.; Geronimo, R.C.; Santos, M.D.	Marine Policy	2021	10.1016/j.marpol.2021.104710	4	The main aim of this study was to help develop a vulnerability assessment tool that can be applied in the various nodes of the fisheries and aquaculture value chains with a long-term view of enhancing the resilience of the fisheries and helping increase the adaptive capacity of the fishing communities.
6	Coastal wetland management in the Great Barrier Reef: Farmer perceptions	Oza, T.M.; Lane, R.; Adame, M.F.; Reef, R.	Geographical Research	2021	10.1111/1745-5871.12497	4	In this study, we have employed a social-ecological approach to understand farmers' attitudes to existing nutrient and sediment management approaches, assess farmers' perceptions of managing coastal wetlands to ameliorate agricultural run-off, and propose how these findings could inform integrative policy development for the Great Barrier Reef.

2	Supply-demand risk assessment and multi-scenario simulation of regional water-energy-food nexus: A case study of the Beijing-Tianjin-Hebei region	Wang, Y.; Zhao, Y.; Wang, Y.; Ma, X.; Bo, H.; Luo, J.	Resources, Conservation and Recycling	2021	10.1016/j.resconrec.2021.105799	4	In this study, a Bayesian network (BN) model was used to construct the supply-demand risk assessment framework, identify the risk factors during different periods in the Beijing-Tianjin-Hebei (BTH) region, and simulate the probability of supply-demand risk under different scenarios.
2	Human ecological analysis of farmers' pro-environmental behaviour in the face of drought: Application of Norm Activation Theory	Hallaj, Z.; Sadighi, H.; Farhadian, H.; Bijani, M.	Water and Environment Journal	2021	10.1111/wej.12733	4	This study aims to investigate farmers' pro-environmental behaviour (FPB) under drought conditions.
6	Envisioning the Future of Mosaic Landscapes: Actor Perceptions in a Mixed Cocoa/Oil-Palm Area in Ghana	Asubonteng, K.O.; Ros-Tonen, M.A.F.; Baud, I.; Pfeffer, K.	Environmental Management	2021	10.1007/s00267-020-01368-4	4	This study therefore presents a participatory spatial scenario-building methodology that uncovers local perceptions of landscape dynamics and needed actions in a mixed cocoa-oil-palm landscape in Ghana's Eastern Region.
2	Fishermen behavior in the use of information and communication technologies (Icts) in central java province, indonesia: Comparative study in pati and pemalang regencies	Nugroho, S.B.M.; Susilowati, I.; Thohir, M.; Prastyadewi, M.I.; Suciati, I.	AACL Bioflux	2021		4	This research purpose was to compare fisheries awareness level in the use of information and communication technologies in two potential fishing locations in the northern coastal area of Central Java, namely Pati and Pemalang regencies.
16	The Mittimatalik Siku Asijjipallianinga (Sea Ice Climate Atlas): How Inuit Knowledge, Earth Observations, and Sea Ice Charts Can Fill IPCC Climate Knowledge Gaps	Wilson, K.; Arreak, A.; Bell, T.; Ljubicic, G.	Frontiers in Climate	2021	10.3389/fclim.2021.715105	4	This paper presents the novel approach used to develop the atlas based on Inuit knowledge, earth observations and Canadian Ice Service (CIS) sea ice charts, and demonstrates its application. The atlas provides an adaptation tool that Mittimatalik can use to share locations of known and changing sea ice conditions to plan for safe sea ice travel.
2	An integrative approach to planning for community-based adaptation to sea-level rise in Thailand	Markphol, A.; Kittitornkool, J.; Armitage, D.; Chotikarn, P.	Ocean and Coastal Management	2021	10.1016/j.ocecoaman.2021.105846	4	This paper outlines an integrative process for community-based adaptation plans to sea-level rise (SLR) effects in Kohklang Sub-district, Thailand. Three objectives guide this research: (1) to identify flood prone areas and develop a coastal vulnerability index (CVI) (e.g., to estimate ecosystem service impacts and economic loss in flood prone areas); (2) to co-develop risk profiles and social vulnerability assessment; and (3) to synthesize assessment outcomes and generate corresponding adaptation plans and recommendations
11	Life without ice: Perceptions of environmental impacts on marine resources and subsistence users of St. Lawrence Island	Larsen Tempel, J.T.; Wise, S.; Osborne, T.Q.; Sparks, K.; Atkinson, S.	Ocean and Coastal Management	2021	10.1016/j.ocecoaman.2021.105819	4	Four main themes were assessed: 1) key marine resources for SLI communities, 2) perceptions about changes in key resources, 3) community responses to change, and 4) the future of the subsistence way of life in these communities.
27	Project earthrise: Proceedings of the ninth annual conference of in vivo planetary health	Prescott, S.L.; Wegienka, G.; Kort, R.; Nelson D.H.; Gabrysch S.; Hancock T.; Kozyrskyj A.; Lowry C.A.; Lowry C.A.; Redvers N.; Poland B.; Robinson J.; Moubarac J.-C.; Logan, A.C., Berman, B.	International Journal of Environmental Research and Public Health	2021	10.3390/ijerph182010654	4	We initiated Project Earthrise at our 2020 annual conference of inVIVO Planetary Health. This builds on the emergent concept of planetary health, which provides a shared narrative to integrate rich and diverse approaches from all aspects of society towards shared solutions to global challenges.
6	Resilience and the mobitility of identity: Belonging and change among Turkana Herders in Northern Keyna	Semplici, G.	Nomadic Peoples	2021	10.3197/NP.2021.250204	4	Article about resilience.
2	Building an agroecological process towards agricultural sustainability: A case study from Southern Spain	González-Rosado, M.; Parras-Alcántara, L.; Aguilera-Huertas, J.; Lozano-García, B.	Agriculture (Switzerland)	2021	10.3390/agriculture11101024	6	In this study, we present the building process and consolidation of an agro-ecological project (Extiercol) in a rural area of southern Spain, with a prolonged depopulation process and close connections to nearby urban areas. Through participatory action research, the specific objectives of this study are (1) to describe the agroecological collective process from its creation by a youth association to its establishment as a viable agricultural project; (2) to identify the drivers for the development of this type of transition process towards agricultural sustainability and (3) to analyse urban-rural alliances in the establishment of agroecological projects.
2	Mapping global research on agricultural insurance	Vyas, S.; Dalhaus, T.; Kropff, M.; Aggarwal, P.; Meuwissen, M.P.M.	Environmental Research Letters	2021	10.1088/1748-9326/ac263d	4	We conducted a systematic review of 796 peer-reviewed papers on agricultural insurance published between 2000 and 2019. The goal of this review was twofold: (a) categorizing agricultural insurance literature by agricultural product insured, research theme, geographical study area, insurance type and hazards covered, and (b) mapping country-wise research intensity of these indicators vis-vis historical and projected risk and crisis events - extreme weather disasters, projected temperature increase under SSP5 (Shared Socioeconomic Pathways) scenario and livestock epidemics.
6	Farmers' adaptations of soil and water conservation in mitigating climate change	Everest, B.	Arabian Journal of Geosciences	2021	10.1007/s12517-021-08534-w	3	Not small farmers, location: Balıkesir and Çanakkale provinces of Turkey. Farmers generally living in the city or town center.
6	Climate change challenges and community-led development strategies: Do they fit together in fisheries regions?	Furmankiewicz, M.; Hewitt, R.J.; Kapusta, A.; Solecka, I.	Energies	2021	10.3390/en14206614	3	In this paper we analyse the Fisheries and Sea Operational Programme 2014–2020 and 36 Local Development Strategies prepared within the framework of this programme for the case of Poland. The aim was to assess the degree to which local stakeholders sought to address the climate challenge.
6	Elucidating traditional rice varieties for consilient biotic and abiotic stress management under changing climate with landscape-level rice biodiversity	Muralikrishnan, L.; Padaria, R.N.; Dass, A.; Choudhary A.K.; Kakade B.; Shokralla S.; Zin El-Abedin T.K.; Almutairi, K.F.; Elansary, H.O.	Land	2021	10.3390/land10101058	4	A random sample survey of farmers (n=320), alongwith secondary data collection from non-governmental organizations/farmers' organizations/farmers, led to documentation of the information on traditional rice varieties - TRVs' biodiversity in South Asia. The current study (2015-2019) explored and documented ~164 TRVs which may enhance the resilience to climatic-risks with improved yields besides their unique therapeutic benefits.
2	Has the risk of a 1976 north-west European summer drought and heatwave event increased since the 1970s because of climate change?	Baker, L.; Shaffrey, L.; Hawkins, E.	Quarterly Journal of the Royal Meteorological Society	2021	10.1002/qj.4172	6	This study aims to assess how the likelihood of the event in the present-day climate has changed since 1976 because of climate change. The analysis focuses on the England and Wales region, which was particularly badly impacted.
2	Rise and fall of vegetation annual primary production resilience to climate variability projected by a large ensemble of Earth System Models' simulations	Zampieri, M.; Grizzetti, B.; Toreti, A.; De Palma, P.; Collalti, A.	Environmental Research Letters	2021	10.1088/1748-9326/ac2407	4	We compute the Annual Production Resilience Indicator from gross primary production (GPP) data simulated by a large ensemble of state-of-the-art Earth System Models involved in the last Coupled Model Intercomparison Project (CMIP6) of the Intergovernmental Panel on Climate Change.
6	The effect of climate variability on maize production in the ejura-sekyedumase municipality, ghana	Cudjoe, G.P.; Antwi-Agyei, P.; Gyampoh, B.A.	Climate	2021	10.3390/cli9100145	2	Ejura-Sekyedumase Municipality is a regional hub of commercial corn production.
2	Climate change and lithuania's livestock farms: Awareness and reactions, an explorative study	Calciolari, F.; Novikova, A.; Rocchi, L.	Sustainability (Switzerland)	2021	10.3390/su131910567	3	The present paper is the first qualitative study on the farmers' perceptions of vulnerability of the agricultural systems and application of mitigation and adaptation strategies in the Baltic area, specifically in Lithuania.

11	Is the political divide on climate change narrower for people of color? Evidence from a decade of U.S. polling	Ballew, M.T.; Pearson, A.R.; Schuldt, J.P.; Kotcher J.E.; Maibach E.W.; Rosenthal, S.A.; Leiserowitz, A.	Journal of Environmental Psychology	2021	10.1016/j.jenvp.2021.101680	6	Location: USA. We conducted a conceptual replication and extension of previous research on the "racial/ethnic gap" in U.S. climate change opinion.
6	Canadian horticultural growers' perceptions of beneficial management practices for improved on-farm water management	Bogdan, A.-M.; Kulshreshtha, S.N.	Journal of Rural Studies	2021	10.1016/j.jrurstud.2021.08.020	3	This study uses data from a survey of 70 fruit and vegetable growers in Eastern Canadian.
6	Determinants of climate change adaptation strategies in the coastal zone of Bangladesh: implications for adaptation to climate change in developing countries	Kabir, A.; Amin, M.N.; Roy, K.; Hossain, M.S.	Mitigation and Adaptation Strategies for Global Change	2021	10.1007/s11027-021-09968-z	3	This study makes a first attempt to explore the determinants of adaptation to climate change and choices of adaptation strategies at a larger spatial scale of the south-west coastal areas in Bangladesh. No specifies smallholder.
6	Multi-step cognitive mapping of perceived nexus relationships in the Seewinkel region in Austria	Kropf, B.; Schmid, E.; Mitter, H.	Environmental Science and Policy	2021	10.1016/j.envsci.2021.08.004	4	We adopt a nexus perspective to elicit sectoral stakeholders' perceptions on the relationships of the regional nexus entities, relevant measures and their perceived synergies and trade-offs in the semi-arid agricultural production region Seewinkel in East Austria.
6	Coping and Adaptation in Response to Environmental and Climatic Stressors in Caribbean Coastal Communities	Touza, J.; Lacambra, C.; Kiss, A.; Amboage R.M.; Sierra P.; Solan M.; Godbold J.A.; Spencer, T.; White, P.C.L.	Environmental Management	2021	10.1007/s00267-021-01500-y	4	We seek to understand the relationship between responses to the impacts of El Niño and La Niña events and the vulnerability of mangrove-dependent communities in the Caribbean region of Colombia.
6	Factors affecting farmers' use of organic and inorganic fertilizers in South Asia	Aryal, J.P.; Sapkota, T.B.; Krupnik, T.J.; Rahut D.B.; Jat, M.L.; Stirling, C.M.	Environmental Science and Pollution Research	2021	10.1007/s11356-021-13975-7	4	Using data from 2528 households across the Indo-Gangetic Plains in India, Nepal, and Bangladesh, this study examines the factors affecting farmers' use of organic and inorganic fertilizers for the two most important cereal crops – rice and wheat.
6	Time to Transition: Barriers and Opportunities to Farmer Adoption of Soil GHG Mitigation Practices in Dutch Agriculture	Gomes, A.; Reidsma, P.	Frontiers in Sustainable Food Systems	2021	10.3389/fsufs.2021.706113	4	This research identifies the barriers and opportunities for arable farmers to adopt practices which mitigate emissions from agricultural soils, and consists of a literature review, informant interviews, and semi-structured interviews with farmers, policy-makers, and boundary organizations.
2	Estimating and modelling the risk of redox-sensitive phosphorus loss from saturated soils using different soil tests	Smith, G.J.; McDowell, R.W.; Daly, K.; Ó hUallacháin D.; Condron, L.M.; Fenton, O.	Geoderma	2021	10.1016/j.geoderma.2021.115094	4	In the present study, anoxic water extractable P test (anoxic WEP) and sodium bicarbonate-dithionite extractable P (Dithionite-P) tests were first developed using samples from New Zealand and Ireland, and were used to predict P that is available under anoxic conditions in the short- and long-term.
6	Perceptions of Public Officers Towards the Effects of Climate Change on Ecosystem Services: A Case-Study From Northern Portugal	Vaz, A.S.; Graça, M.; Carvalho-Santos, C.; Pinto E.; Vicente J.R.; Honrado, J.P.; Santos, J.A.	Frontiers in Ecology and Evolution	2021	10.3389/fevo.2021.710293	6	This study analyses the views of public officers on the potential impacts of climate-change related drivers on multiple ES in a major administrative region from Portugal (EU NUTS 3).
2	Integrated Life Cycle Assessment for Sustainable Remediation of Contaminated Agricultural Soil in China	Jin, Y.; Wang, L.; Song, Y.; Zhu J.; Qin M.; Wu L.; Hu P.; Li F.; Fang L.; Chen C.; Hou, D.	Environmental Science and Technology	2021	10.1021/acs.est.1c02535	4	In the present study, an integrated life cycle assessment analysis was conducted to evaluate life cycle primary, secondary, and tertiary impacts associated with the restoration of the contaminated agricultural land.
6	Is drought caused by fate? Analysis of farmers' perception and its influencing factors in the irrigation areas of gap-Şanlıurfa, turkey	Aydoğdu, M.H.; Cançelik, M.; Sevinç, M.R.; Çullu M.A.; Yenigün K.; Küçük N.; Karlı B.; Ökten Ş.; Beyazgül U.; Doğan H.P.; Şahin Z.; Mutlu N.; Yenikale, A.	Water (Switzerland)	2021	10.3390/w13182519	6	Location: Şanlıurfa, Turkey.
19	Impact of climate adaptation strategies on the net farm revenue of underutilised indigenous vegetables' (UIVs) production in Southwest Nigeria	Tanimonure, V.A.; Naziri, D.	Resources, Environment and Sustainability	2021	10.1016/j.resenv.2021.100029	4	This paper examined the impact of climate adaptation strategies employed by Underutilised Indigenous Vegetables (UIVs) farmers on UIVs' net revenue of adopters and non-adopters of adaptation strategy in Southwest Nigeria.
2	Spatial trend analysis of temperature and rainfall and their perceived impacts on ecosystem services in Mau Forest, Kenya	Jebiwott, A.; Ogendi, G.M.; Agbeja, B.O.; Alo, A.A.; Maina, G.M.	International Journal of Sustainable Development and Planning	2021	10.18280/ijsdp.160504	3	This study's objective was to assess the local climate trend in terms of rainfall and temperature and their perceived impacts on ecosystem services in Mau Forest, from 1984 to 2020. We obtained gridded meteorological data for the study area from the Kenya Meteorological Department and analyzed it using Mann Kendell's test to identify significant trends in temperature and rainfall.
2	Climate Uncertainty and Optimal Groundwater Augmentation	Tran, D.Q.; Kovacs, K.F.	Water Resources Research	2021	10.1029/2021WR030114	4	Two approaches to augment irrigation water supply are managed aquifer recharge (MAR) and on-farm reservoirs with tail-water recovery (OFS-TWR). We explore the joint use of MAR and OFS-TWR to sustain groundwater and agricultural income with climate variability by farmer risk preference.
2	The fate of the caspian sea under projected climate change and water extraction during the 21st century	Koriche, S.A.; Singarayer, J.S.; Cloke, H.L.	Environmental Research Letters	2021	10.1088/1748-9326/ac1af5	4	In this study we investigated the water budget variation in the Caspian Sea drainage basin and its potential impact on Caspian Sea (CS) level during the 21st century using projected climate from selected climate change scenarios of shared socioeconomic pathways (SSPs) and representative concentration pathways (RCPs), and explored the impact of human extractions.
2	Climate vulnerability scenario of the agricultural sector in the Bicol River Basin, Philippines	Laureta, R.P.; Regalado, R.R.H.; De La Cruz, E.B.	Climatic Change	2021	10.1007/s10584-021-03208-8	4	This paper investigated the vulnerability of the agriculture sector and rural agriculture livelihoods in the Bicol River Basin (BRB) of the Philippines to projected changes in climate.
2	Spatiotemporal variation of water supply and demand balance under drought risk and its relationship with maize yield: A case study in midwestern Jilin Province, China	Ma, Y.; Zhang, J.; Zhao, C.; Li, K.; Dong, S.; Liu, X.; Tong, Z.	Water (Switzerland)	2021	10.3390/w13182490	4	We analyzed the balance of water supply and demand in each growth period and the degree of maize yield affected by drought.
2	Assessing desertification sensitivity map under climate change and agricultural practices scenarios: The island of Crete case study	Morianou, G.; Kourgialas, N.N.; Psarras, G.; Pisinaras, V.; Arambatzis, G.	Water Science and Technology: Water Supply	2021	10.2166/ws.2021.132	4	The aim of this study is the assessment of desertification risk for a typical Mediterranean island, in the frame of climate change and the application of good agricultural practices.
2	Risk assessment of possible impacts of climate change and irrigation on wheat yield and quality with a modified ceres-wheat model	Liu, J.; Yao, W.; Jiang, M.	Journal of Water and Climate Change	2021	10.2166/wcc.2021.248	4	A modified quality model was used to simulate integrated impacts of climate change, environment, and management on wheat yield and quality. Then, the Canadian Earth System Model version 5 (CanESM5) was used to forecast the daily meteorological data, and the Statistical Downscaling Model (SDSM V5.2) was used for downscaling.

6	Development versus adaptation? Facing climate change in Ca Mau, Vietnam	Di Giusto, B.; Le, T.M.N.; Nguyen, T.T.M.; Nguyen, T.T.H.; Vu, N.U.M.; Lavallee, J.P.	Atmosphere	2021	10.3390/atmos12091160	6	Location: Ca Mau, Vietnam.
6	Constructed wetlands to face water scarcity and water pollution risks: Learning from farmers' perception in alicante, spain	Ricart, S.; Rico-Amorós, A.M.	Water (Switzerland)	2021	10.3390/w13172431	6	Location: Alicante, Spain.
6	Farmers' perceived vulnerability and proactive versus reactive climate change adaptation in chile's maule region	Engler, A.; Rotman, M.L.; Poortvliet, P.M.	Sustainability (Switzerland)	2021	10.3390/su13179907	3	Vineyards are the main production activities.
6	Values underlying preferences for adaptive governance in a chilean small-scale fishing community	Ebel,S.A.; Beitl, C.M.; Torre, M.P.	Environmental Values	2021	10.3197/096327120X15973379803717	4	This paper uses a value-based approach to examine individual and institutional preferences for adaptive governance in Carelmapu, Chile. We show that two groups had different value frames rooted in divergent ontologies which influenced their actions related to adaptive governance, cre-ating conflict.
6	Role of agricultural diversification in improving resilience to climate change: An empirical analysis with gaussian paradigm	Kiani, A.K.; Sardar, A.; Khan, W.U.; He, YG; Bilgic, A; Kuslu, Y; Raja, MAZ	Sustainability (Switzerland)	2021	10.3390/su13179539	4	Article about Agricultural diversification.
6	Emic views of community resilience and coastal tourism development	Naylor, R.S.; Hunt, C.A.; Zimmerer, K.S.; Taff, B.D.	Societies	2021	10.3390/soc11030094	4	The purpose of this study is to assess the impact of small-scale cruise tourism on coastal community resiliency in Petersburg, Alaska.
2	Crops and farmers' response to application of fecal sludge derived - Fortifer™ in different agro-ecological zones in Ghana	Nartey, E.G.; Cofie, O.; Gebrezgabher, S.; Nikiema, J.	Journal of Environmental Management	2021	10.1016/j.jenvman.2021.112970	4	The aim was to (1) create awareness among smallholder farmers for widespread use of Fortifer™ (2) observe the response of crops to Fortifer™ application by farmers in different agro-ecological zones (3) obtain farmers feedback on the FS-derived product to enhance further dissemination across the country.
2	Cadmium (Cd), Copper (Cu), and Zinc (Zn) levels in commercial and non-commercial fishes in the Blanakan River Estuary, Indonesia: A preliminary study	Takarina, N.D.; Purwiyanto, A.I.S.; Suteja, Y.	Marine Pollution Bulletin	2021	10.1016/j.marpolbul.2021.112607	4	This study investigates Cu, Cd, and Zn metals in water and their accumulation in fish (commercial and non-commercial).
19	National parks best practices: Lessons from a century's worth of national parks management	Ferretti-Gallon, K.; Griggs, E.; Shrestha, A.; Wang, G.	International Journal of Geoheritage and Parks	2021	10.1016/j.ijgeop.2021.05.004	4	With over a century of national park management experience, the institutional knowledge of national park systems in Australia, Canada, New Zealand, and the United States can offer a valuable insight into management best practices. Twelve open-ended semistructured interviews with national park experts representing the four systems revealed valuable lessons learned in major facets of national park management.
6	Stakeholder perceptions on actions for marine fisheries adaptation to climate change	Fogarty, H.E.; Cvitanovic, C.; Hobday, A.J.; Pecl, G.T.	Marine and Freshwater Research	2021	10.1071/MF21055	3	This research investigated current and future potential for climate adaptation to be integrated into fisheries management strategies using Tasmanian commercial wild-catch fisheries as a case study, and then identified obstacles and recommendations for fisheries management to better adapt to future climate changes.
6	Socioeconomic factors influencing the choice of climate-smart soil practices among farmers in western Kenya	Mogaka, B.O.; Bett, H.K.; Ng'ang'a, S.K.	Journal of Agriculture and Food Research	2021	10.1016/j.jafr.2021.100168	4	This study examines the socio-economic factors that influence the adoption choice of climate-smart soil (CSS) practices among farmers in three Counties: Kakamega, Bungoma, and Siaya, in western Kenya.
6	Invasion status and impacts of parthenium weed (Parthenium hysterophorus) in West-Central region of Bhutan	Chhogyel, N.; Kumar, L.; Bajgai, Y.	Biological Invasions	2021	10.1007/s10530-021-02534-3	4	Article about Parthenium weed (Parthenium hysterophorus L.) is an invasive alien plant species.
6	Global Crises: Gendered Vulnerabilities of Structural Inequality, Environmental Performance, and Modern Slavery	Cameron, E.C.; Hemingway, S.L.; Cunningham, F.J.; Jacquin, K.M.	Human Arenas	2021	10.1007/s42087-020-00154-2	4	Our research examined the relationship between environmental stressors associated with climate change, selected structural inequalities, and the estimated prevalence of modern slavery cases across 180 countries.
6	Assessing and building climate change resilience of farming systems in Tunisian semi-arid areas	Ben Nasr, J.; Chaar , H.; Bouchiba, F.; Zaibet, L.	Environmental Science and Pollution Research	2021	10.1007/s11356-021-13089-0	4	This paper aims to analyze climate change resilience of agricultural production systems in Tunisian semi-arid areas and to propose options for policy interventions.
6	Potential adaptation strategies for climate change impact among flood-prone fish farmers in climate hotspot Uganda	Oyebola, O.O.; Efitre, J.; Musinguzi, L.; Falaye, A.E.	Environment, Development and Sustainability	2021	10.1007/s10668-020-01183-1	4	Climate-induced floods are increasing in Africa. The need to evolve framework for adaptation to climate change impact (CCI) among flood-prone fish farmers necessitated this study. Based on availability, 60 farming active flood-experienced fish farmers were purposively selected from flood-prone (Gulu and Kibuku) regions in climate hotspot Uganda.
6	Cooling Interventions Among Agricultural Workers: Qualitative Field-Based Study	Chicas, R.; Xiuhtecutli N.; Dickman, N.E.; Flocks, J.; Scammell ,M.K.; Steenland, K.; Hertzberg, V.; McCauley, L.	Hispanic Health Care International	2021	10.1177/1540415321993429	4	To date, an analysis of agricultural workers' experience and perception of cooling devices used in the field while working has not been published. Methods: Qualitatively data from 61 agricultural workers provided details of their perceptions and experiences with cooling interventions.
6	Farmers' perception on combined climatic and market risks and their adaptive behaviors: a case in Shandong Province of China	Yarong, L.; Minpeng, C.	Environment, Development and Sustainability	2021	10.1007/s10668-020-01198-8	6	Location: Shandong, China. The abstract doesn't mention if they are smallholders.
6	Climate change adaptation: The case of coastal communities in the philippines	Peñalba, E.H.; David, A.P.J.; Mabanta, M.J.D.; Samaniego, C.R.C.; Ellamil, S.D.S.,	Journal of the Geographical Institute Jovan Cvijic SASA	2021	10.2298/IJGI2102115P	6	Location: province of Bulacan.
6	Comparative Transcriptomics and Metabolomics Reveal an Intricate Priming Mechanism Involved in PGPR-Mediated Salt Tolerance in Tomato	Mellidou, I.; Ainalidou, A.; Papadopoulou, A.; Leontidou, K.; Genitsaris, S.; Karagiannis, E.; Van de Poel, B.; Karamanoli, K.	Frontiers in Plant Science	2021	10.3389/fpls.2021.713984	4	In this study, we aimed to further evaluate the effects of AXSa06 seed inoculation on the growth of tomato seedlings under excess salt (200 mM NaCl) by deciphering their transcriptomic and metabolomic profiles.
26	Climate change perception and its impact on net farm income of smallholder rice farmers in South-West, Nigeria	Ojo, T.O.; Baiyegunhi, L.J.S.	Journal of Cleaner Production	2021	10.1016/j.jclepro.2021.127373	3	Monoculture production (rice).

2	Greenhouse Gas Emissions and Carbon Sinks of an Italian Natural Park	Grossi, G.; Vitali, A.; Bernabucci, U.; Lacetera, N.; Nardone, A.	Frontiers in Environmental Science	2021	10.3389/fenvs.2021.706880	4	The framework proposed in this paper provides for the first time a holistic methodological approach to quantitatively and qualitatively estimate the annual greenhouse gas (GHG) emissions and removals occurring in Natural Parks.
2	Resilient Governance Regimes That Support Urban Agriculture in Sub-Saharan Cities: Learning From Local Challenges	Vidal Merino, M.; Gajjar, S.P.; Subedi, A.; Polgar, A.; Van Den Hoof, C.	Frontiers in Sustainable Food Systems	2021	10.3389/fsufs.2021.692167	6	Location: three case cities of Kampala, Tamale and Cape Town.
29	Communicating climate change adaptation strategies: climate-smart agriculture information dissemination pathways among smallholder potato farmers in Gilgil Sub-County, Kenya	Waaswa, A.; Nkurumwa, A.O.; Kibe, A.M.; Kipkemoi, N.J.	Heliyon	2021	10.1016/j.heliyon.2021.e07873	4	This study investigated the information dissemination pathways used by different categories of smallholder potato farmers for and practice of CSAPs.
6	Refusing more empire: utility, colonialism, and Indigenous knowing	Callison, C.	Climatic Change	2021	10.1007/s10584-021-03188-9	4	This paper suggests that Indigenous climate change studies as proposed by Whyte (English Language Notes 55(1-2):153-162, 2017) offer a differentiated approach and critique to thinking about context, climate events utility, and ecological relations.
2	Long-term evaluation of soil salinization risks under different climate change scenarios in a semi-arid region of Tunisia	Kanzari, S.; Jaziri, R.; Ali, K.B.; Daghari, I.	Water Supply	2021	10.2166/ws.2021.052	4	The objective of this study is to assess the risk of long-term soil salinization by considering the agricultural practices mentioned in the project for the 'Water Quality' experiment in the semi-arid region of Cherfech (Tunisia).
27	Collection, genotyping and virus elimination of cassava landraces from Tanzania and documentation of farmer knowledge	Ferguson, M.E.; Tumwegamire, S.; Chidzanga, C.; Shah, T.; Mtunda, K.; Kulembeka, H.; Kimata, B.; Tollano, S.; Stephen, M.; Mpayo, E.; Mohamedi, S.; Kasele, S.; Palangyo, E.; Armachius, J.; Ali, A.H.; Sichalwe, K.; Matondo, D.; Masisila, F.; Matumbo, Z.; Kidunda, B.; Arati, A.C.; Muiruri, R.; Munguti, F.; Abass, A.; Abberton, M.; Mkamilo, G.	PLoS ONE	2021	10.1371/journal.pone.0255326	4	We report on cassava germplasm collection missions and documentation of farmer knowledge in seven zones of Tanzania.
6	Climate change and adaptive management: Case study in agriculture, forestry and pastoral areas	Xuan, X.; Liu, B.; Zhang, F.	Land	2021	10.3390/land10080832	4	Based on the theory of adaptive management, this paper selects Yuanping City from Shanxi Province, Qingyuan County from Liaoning Province, and Kulun Banner from Inner Mongolia as representative cases in agricultural, forestry, and pastoral areas, respectively, to carry out field research, and it uses 1970–2017 meteorological station data to apply vulnerability assessment and climate element change trend analysis, combined with the meteorological hazards data, and explore the adaptive management measures for agricultural, forestry, and pastoral areas in China.
6	Modis ndvi multi-temporal analysis confirms farmer perceptions on seasonality variations affecting apple orchards in kinnaur, Himachal Pradesh	Gupta, H.; Kaur, L.; Asra, M.; Avtar, R.; Reddy, C.S.	Agriculture (Switzerland)	2021	10.3390/agriculture11080724	4	Therefore, it is important to study the extent of seasonal variations in the apple growing locations of this region. This study makes that attempt by assessing seasonality variations during a 15-year period from 2004 to 2018 when maximum construction activities occurred in this region.
6	Communities' adaptation and vulnerability to climate change: Implications for achieving a climate-smart landscape	Widayati, A.; Louman, B.; Mulyoutami, E.; Purwanto, E.; Kusters, K.; Zagt, R.	Land	2021	10.3390/land10080816	6	Location: Ketapang, West Kalimantan and about agrocommodity.
6	River basin management planning in the republic of ireland: Past, present and the future	Antwi, S.H.; Linnane, S.; Getty, D.; Rolston, A.	Water (Switzerland)	2021	10.3390/w13152074	4	Article about the River Basin Management Plan (RBMP). It is an essential component of the European Union Water Framework Directive that details an integrated approach required to protect, improve and sustainably manage water resources.
2	Increased water risks to global hydropower in 1.5 °C and 2.0 °C Warmer Worlds	Paltán, H.A.; Pant, R.; Plummer Braeckman, J.; Dadson, S.J.	Journal of Hydrology	2021	10.1016/j.jhydrol.2021.126503	4	Here we use river flows calculated using a multi-model ensemble to investigate the potential water risks which current and planned global hydropower generation capacities may face at 1.5 °C and 2.0 °C warmer worlds.
6	Use of earth observation satellite data to guide the implementation of integrated pest and pollinator management (IPPM) technologies in an avocado production system	Adan, M.; Abdel-Rahman, E.M.; Gachoki, S.; Muriithi, B.W.; Lattorff, H.M.G.; Kerubo, V.; Landmann, T.; Mohamed, S.A.; Tonnang, H.E.Z.; Dubois, T.	Remote Sensing Applications: Society and Environment	2021	10.1016/j.rsase.2021.100566	4	This study aimed to use earth observation (EO) data to characterize landscape dynamics in terms of vegetation productivity to guide the implementation of IPPM interventions in an avocado production system in Murang'a (Kenya).
6	Limitations to adjusting growing periods in different agroecological zones of Pakistan	Shah, H.; Siderius, C.; Hellegers, P.	Agricultural Systems	2021	10.1016/j.agsy.2021.103184	4	This study investigated farm-level adjustments to sowing and harvesting dates (i.e., the growing period) in response to shifts in meteorological crop seasons during the last 30 years. Impacts on yields and farmers' complementary adaptation strategies were also examined.
6	Attitudes to climate change adaptation in agriculture – A case study of Öland, Sweden	Ibrahim, M.A.; Johansson, M.	Journal of Rural Studies	2021	10.1016/j.jrurstud.2021.05.024	6	Location: Öland, the second largest Swedish island (1342 Km2) in the Baltic Sea, located just off the coast of Småland, was selected as the study area.
6	Agricultural land use dynamics in the Brazilian part of La Plata Basin: From driving forces to societal responses	Schlindwein, S.L.; Feitosa de Vasconcelos, A.C.; Bonatti, M.; Sieber, S.; Strapasson, A.; Lana, M.	Land Use Policy	2021	10.1016/j.landusepol.2021.105519	2	This paper provides an analysis of the land use dynamics observed in the Brazilian part of La Plata Basin (BR-LPB) from 1988 to 2018, including major crops such as maize, soybean, wheat, and sugarcane.
6	Do risk perceptions and constraints influence the adoption of climate change practices among small livestock herders in Punjab, Pakistan?	Faisal, M.; Chunping, X.; Abbas, A.; Raza, M.H.; Akhtar, S.; Ajmal, M.A.; Ali, A.	Environmental Science and Pollution Research	2021	10.1007/s11356-021-13771-3	3	For this purpose, a primary data set of 405 small livestock herders from Punjab, Pakistan was used.
6	Adoption of climate-smart agriculture practices and differentiated nutritional outcome among rural households: a case of Punjab province, Pakistan	Haq, S.; Boz, I.; Shahbaz, P.	Food Security	2021	10.1007/s12571-021-01161-z	4	Climate change impacts on agriculture have substantial implications on human diet and nutrition. This study explored the factors affecting the adoption decisions of climate-smart agricultural practices through a multivariate probit model and then assessed the average effect of these adopted practices on rural households' food diversity and per capita dietary intake by using propensity score matching.
6	Livelihood diversification in managing catastrophic risks: evidence from flood-disaster regions of Khyber Pakhtunkhwa Province of Pakistan	Shah, A.A.; Gong, Z.; Khan, N.A.; Khan, I.; Ali, M.; Naqvi, S.A.A.	Environmental Science and Pollution Research	2021	10.1007/s11356-021-13598-y	4	This paper seeks to analyze livelihood diversification in managing catastrophic risks among rural farm households of Khyber Pakhtunkhwa Province of Pakistan.

6	Factor influencing fishery-based farmers' perception and their response to climate-induced crisis management.	Hebbsale Mallappa, V.K.; Shivamurthy, M.	Environment, Development and Sustainability	2021	10.1007/s10668-020-01141-x	4	General (no specifies fishers). The study was conducted to develop a framework and to discuss the perception of fishery-based farmers and their response to the climate-induced crisis through their management practices.
2	Estimating Flood Risk Impact on Farmland Values Using Boundary Discontinuity: Evidence from Lancaster County, Pennsylvania	Wang, H.	Risk Analysis	2021	10.1111/risa.13623	6	The goal of this study is to estimate the impact of flood risk on farmland values in a watershed with active agricultural activities. Using parcel-level data from Lancaster County (Pennsylvania, USA).
6	Challenges of value chain actors for vegetable production and marketing in North-East Bangladesh	Rahman, M.M.; Zhou, D.; Barua, S.; Farid, M.S.; Tahira, K.T.	GeoJournal	2021	10.1007/s10708-020-10170-y	4	A survey was conducted in North-East Bangladesh, specifically Sylhet district to identify the main challenges faced by different value chain actors and their perception of risk management strategies for vegetable production and marketing.
6	Perceived effects of climate change on profit efficiency among small scale chili pepper marketers in Benue State, Nigeria	Djomo, C.R.F.; Ukpe, H.U.; Ngo, N.V.; Mohamadou, S.; Adedze, M.; Pemunta, N.V.	GeoJournal	2021	10.1007/s10708-020-10163-x	3	Small scale chili pepper producers and marketers. Understanding the perception of marketers of agricultural produce about climate change in agribusiness is paramount to sustain small scale enterprises. This study sought to analyze the perceived effects of climate change on profit efficiency among small scale chili pepper marketers in Benue State, Nigeria.
2	A cloud-based dual-objective nonlinear programming model for irrigation water allocation in Northwest China	Yan, Z.; Baetz, B.; Li, Z.	Journal of Cleaner Production	2021	10.1016/j.jclepro.2021.127330	4	In this study, a new uncertainty quantification technique, the cloud model, is introduced to a dual-objective nonlinear programming (DONP) framework, and a cloud-based dual-objective nonlinear programming (CDONP) model is developed to support irrigation water allocation and agricultural water planning under composite uncertainties.
2	An evaluation of influencing factors and public attitudes for the adoption of biogas system in rural communities to overcome energy crisis: A case study of Pakistan	Luo, B.; Khan, A.A.; Ali, M.A.S.; Yu, J.	Science of the Total Environment	2021	10.1016/j.scitotenv.2021.146208	4	This study was conducted in 6 southern districts of Khyber Pakhtunkhwa province of Pakistan, to identify the expected willingness of households for adopting any biogas system.
6	Puerto Rican Farmers' Obstacles Toward Recovery and Adaptation Strategies After Hurricane Maria: A Mixed-Methods Approach to Understanding Adaptive Capacity	Rodríguez-Cruz, L.A.; Moore, M.; Niles, M.T.	Frontiers in Sustainable Food Systems	2021	10.3389/fsufs.2021.662918	4	This paper uses a convergent mixed-methods approach to assess Puerto Rican farmers' actual and intended adoption of adaptation practices, in light of the obstacles they faced toward recovery after 2017's category four Hurricane Maria, to contribute to better understanding adaptive capacity.
6	Posidonia oceanica litter along the Mediterranean Coast of Egypt: Status and a preliminary assessment of nutrients and trace elements contents	Shabaka, S.H.; Khalil, M.K.; El-Sikaily, A.; Youssef, N.A.-E.	Estuarine, Coastal and Shelf Science	2021	10.1016/j.ecss.2021.107342	4	The current study provides the first report on the status and distribution of P. oceanica deposits along the Mediterranean Coast of Egypt, in addition to an assessment of trace elements (TE), organic carbon (OC), and nutrient contents of some of their banquettes.
6	Climate change and informal education in the opinion of forest users in poland	Korcz, N.; Koba, J.; Kobyłka, A.; Janeczko, E.; Gmitrowicz-iwan, J.	Sustainability (Switzerland)	2021	10.3390/su13147892	3	This paper presents the results of a survey on the perceptions of two groups, foresters and recreational forest users, about climate change and its impacts on forested areas; 130 foresters and 146 recreational forest users participated in the survey (total n = 276).
2	Livelihoods and vulnerabilities of small-scale fishers to the impacts of climate variability and change: Insights from the coastal areas of bangladesh	Sunny, A.R.; Prodhan, S.H.; Ashrafuzzaman, M.; Sazzad, S.A.; Rahman, S.M.A.; Billah, M.M.; Hussain, M.; Rahman, M.; Nadim Haider, K.M.; Alam, M.T.	Egyptian Journal of Aquatic Biology and Fisheries	2021	10.21608/EJABF.2021.191652	4	This study identifies the livelihood characteristics of small-scale fishers and how their livelihoods become affected through climate change-induced events, based on fieldwork in four fishing communities in lower Padma hilsa (Tenualosa ilisha) sanctuaries. Study about financial capital, human capital, natural capital, physical capital.
2	Poleward shifts in marine fisheries under Arctic warming	Fauchald, P.; Arneberg, P.; Debernard, J.B.; Lind, S.; Olsen, E.; Hausner, V.H.	Environmental Research Letters	2021	10.1088/1748-9326/ac1010	4	Using a recently released global dataset, we quantify for the first time how fishing activities are responding to diminishing sea ice and a warmer Arctic Ocean.
10	Assessing livelihood vulnerability of minority ethnic groups to climate change: A case study from the northwest mountainous regions of vietnam	Tran, V.T.; An-Vo, D.-A.; Cockfield, G.; Mushtaq S.	Sustainability (Switzerland)	2021	10.3390/su13137106	4	This study uses a livelihood vulnerability index (LVI) method, along with qualitative data analysis, to compare the vulnerability of different smallholder farmers in Son La province, one of the poorest provinces in Vietnam.
2	Climate change adaptation influences and barriers impacting the asian agricultural industry	Nguyen, T.-H.; Sahin, O.; Howes, M.	Sustainability (Switzerland)	2021	10.3390/su13137346	8	Non-primary data. Little attention has been paid, however, to reviewing adaptation initiatives amongst farmers in Asia. This article fills this knowledge gap by examining the current literature on Asian farmers' perception of climate change, their adaptation strategies, key factors influencing their choices, and the barriers to change. A systematic quantitative literature review is undertaken of 48 papers taken from a range of sources.
2	Reassessing existing reservoir supply capacity and management resilience under climate change and sediment deposition	Bekri, E.S.; Economou, P.; Yannopoulos, P.C.; Demetracopoulos, A.C.	Water (Switzerland)	2021	10.3390/w13131819	4	This paper proposes a methodological framework to reassess supply capacity and management resilience for an existing reservoir under challenges.
2	Co-creation as the solution to sustainability challenges in the greenhouse horticultural industry: The importance of a structured innovation management process	Moons, I.; Daems, K.; Van de Velde, L.L.J.	Sustainability (Switzerland)	2021	10.3390/su13137149	3	This study's purpose is to investigate how co-creation processes that develop sustainable and climate-neutral high-tech innovations in the greenhouse horticultural industry should be structured and how stakeholder relationship management affects the progress of innovation development.
10	Nuya kankantawa (we are feeling healthy): Understandings of health and wellbeing among Shawi of the Peruvian Amazon	Bussalleu, A.; King, N.; Pizango, P.; Ford, J.; Carcamo, C.P.; Harper, S.L.; IHACC Research Team.	Social Science and Medicine	2021	10.1016/j.socscimed.2021.114107	4	This study characterized two Shawi communities' understandings of what it means to be healthy.
11	Bioenergy opportunities, barriers and challenges in the Arabian Peninsula – Resource modelling, surveys & interviews	Welfle, A.; Alawadhi A.	Biomass and Bioenergy	2021	10.1016/j.biombioe.2021.106083	4	This paper presents the outputs of biomass resource modelling analyses that identify bioenergy opportunities across the region.
2	First tick and tick damage perception survey among sedentary and transhumant pastoralists in Burkina Faso and Benin	Zannou, O.M.; Ouedraogo, A.S.; Biguezoton, A.S.; Yao, K.P.; Abatih, E.; Farougou, S.; Lenaert, M.; Lempereur, L.; Saegerman, C.	Veterinary Medicine and Science	2021	10.1002/vms3.414	4	Using a questionnaire survey and statistical modelling, this study explores the perception of herders about ticks and TBD in cattle, their practices in tick control and the social groups involved in cattle farming in eastern Burkina Faso (46 random herds) and in the northern Benin (44 random herds).
2	Assessing the effects of desertification control projects using socio-economic indicators in the arid regions of eastern Iran	Khashtabeh, R.; Akbari, M.; Kolahi, M.; Talebanfard, A.	Environment, Development and Sustainability	2021	10.1007/s10668-020-01065-6	3	This study aims to assess these projects in the east of Iran using socio-economic criteria. Rates of migration, education, and participation and also factors of poverty, health, income and livelihood, investment, and employment are used to assess social and economic criteria, respectively. Forty-seven individuals were selected among local elders, facilitators, executive managers, and as well as experts and specialists at relevant organizations and agencies.

6	Does adoption of climate-smart agriculture (CSA) practices improve farmers' crop income? Assessing the determinants and its impacts in Punjab province, Pakistan	Sardar, A.; Kiani, A.K.; Kuslu Y.	Environment, Development and Sustainability	2021	10.1007/s10668-020-01049-6	4	The present study is designed to explore the adoption of Climat Smart Agriculture (CSA) practices and the intensity, assessing through its determinants, and estimating its benefits in terms of its impacts on crop yield and farm income. For this purpose, 420 farmers were interviewed across three agro-ecological zones of Punjab, Pakistan.
11	Farmers intention to adopt sustainable agriculture hinges on climate awareness: The case of Vietnamese coffee	Nguyen, N.; Drakou, E.G.	Journal of Cleaner Production	2021	10.1016/j.jclepro.2021.126828	4	In this paper we explore the factors that influence farmers' intention to adopt sustainable agricultural practices (SAP) for coffee farming using data from 93 interviews in Ban Me Thuot, Vietnam.
10	Innovative climate-smart agriculture (Csa) practices in the smallholder farming system of south africa	Obi, A.; Maya, O.	Sustainability (Switzerland)	2021	10.3390/su13126848	4	This study was conducted in three local municipalities of the Eastern Cape Province of South Africa to determine the patterns of smallholder choice of alternative climate-smart agricultural (CSA) practices and the factors affecting such choices.
2	Gendered dimensions of unpaid activities: An empirical insight into rural bangladesh households	Islam, F.B.; Sharma, M.	Sustainability (Switzerland)	2021	10.3390/su13126670	4	This study used the feminist political ecology framework to contextualize and analyze time allocated toward unpaid works, culturally accepted as female/gendered activities, and the nuanced power dynamics between men and women within the rural households of Bangladesh.
2	Types of vertical smart farms and awareness of their use in Korean cities types and feasibility analysis of vertical smart farms in Korean cities	Heo, H.K.; Lee, E.	Journal of People, Plants, and Environment	2021	10.11628/ksppe.2021.24.3.257	6	Study about vertical smart farm (VSF) in Korea.
2	An empirical study on attitudes towards willingness to pay for forest ecosystem services at Simlipal National Park	Agarwalla, S.; Saha, D.	Indian Journal of Ecology	2021	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85109737952&partnerID=40&md5=d79540fed8b007c56b18768746b50228	4	This paper is an attempt to determine the mean willingness to pay of the forest-fringe households for the ecosystem services provided by the Simlipal National Park, Odisha, India, and to determine the key factors affecting the willingness to pay through econometric modelling after creating environmental awareness in the studied region.
6	Agricultural climate change adaptation in Kebumen, central Java, Indonesia	Sekaranom, A.B.; Nurjani, E.; Nucifera, F.	Sustainability (Switzerland)	2021	10.3390/su13137069	6	Productive agricultural areas in Kebumen, Central Java, Indonesia are potentially vulnerable to the adverse impacts of climate change. We surveyed small-scale farmers to assess climate change-related perceptions and adaptations in the agriculture sector.
6	How reindeer herders cope with harsh winter conditions in northern finland: Insights from an interview study	Turunen, M.; Soppela, P.; Ocobock, C.	Arctic	2021	10.14430/arctic72667	4	Reindeer herding involves hard physical work carried out in a cold climate under variable weather conditions. In the fall and winter, herders' work in northern Finland includes collecting and moving reindeer herds to round-up sites, working in round-ups, slaughtering and processing meat as well as daily feeding and monitoring of the animals in the field. To study the experiences and perceptions of coping with cold among physically active herders in harsh winter conditions, we interviewed 22 herders from six herding districts of the central reindeer management area within the north boreal coniferous forest zone.
10	Climate change perceptions by smallholder coffee farmers in the northern and southern highlands of tanzania	Mbwambo, S.G.; Mourice, S.K.; Tarimo A.J.P.	Climate	2021	10.3390/cli9060090	3	The study area was purposively selected based on the level of Arabica coffee production.
2	Climate change in the context of whole-farming systems: opportunities for improved outreach	Clements, R.S.; Birthisel, S.K.; Daigneault, A.; Gallandt, E.; Johnson, D.; Wentworth, T.; Niles, M.T.	Climatic Change	2021	10.1007/s10584-021-03101-4	6	To compare how farmers and outreach professionals in northern New England consider climate change within the context of whole-farming systems, we conducted mental modeling interviews with 33 farmers and 16 outreach professionals.
6	Past and future changes of the Austrian climate – Importance for tourism	Olefs, M.; Formayer, H.; Gobiet, A.; Marke, T.; Schöner, W.; Revesz M.	Journal of Outdoor Recreation and Tourism	2021	10.1016/j.jort.2021.100395	6	The paper summarizes changes of the climate conditions in Austria impacting tourism as part of an extended literature review.
10	Fishers perceptions of ecosystem service change associated with climate-disturbed coral reefs	Woodhead, A.J.; Graham, N.A.J.; Robinson, J.P.W.; Norström, A.V.; Bodin, N.; Marie, S.; Balett, M.-C.; Hicks, C.C.	People and Nature	2021	10.1002/pan3.10220	4	To capture perceptions of change in four ecosystem services associated with coral reefs (habitat, fishery, coastal protection and recreation services), we conducted 41 semi-structured interviews with coral reef fishers from Seychelles, where reef ecosystems have been severely impacted by climate disturbance.
10	"Trees Are Our Relatives": Local Perceptions on Forestry Resources and Implications for Climate Change Mitigation	Chanza, N.; Musakwa, W.	Sustainability (Switzerland)	2021	10.3390/su13115885	4	Local Perceptions on Forestry Resources.
6	The value and limitations of local ecological knowledge: Longitudinal and retrospective assessment of flagship species in Golfo Dulce, Costa Rica	Bessesen, B.L.; González-Suárez, M.	People and Nature	2021	10.1002/pan3.10219	4	Here we explore the value and limitations of LEK to assess the status of several flagship species of tourism interest: cetaceans, sea turtles, whale sharks and sea snakes in a unique tropical fiord and biodiversity hotspot, Golfo Dulce, Costa Rica. We analysed the interviews conducted with fishermen and tour boat guides in 2010 and 2020 and compared their responses to biomonitoring data obtained through boat-based sighting surveys during the same two time periods.
6	Climate change threatens nomadic herding in Mongolia: A model of climate change risk perception and behavioral adaptation	Sattler, D.N.; Bishkhorloo, B.; Graham, J.M.	Journal of Environmental Psychology	2021	10.1016/j.jenvp.2021.101620	4	This study develops a model of climate change behavioral intention with nomadic herders in Mongolia. The model considers the relationships among resource loss, stress, coping and social support, posttraumatic growth, climate change knowledge, norms, and risk perceptions with climate change behavioral intention.
6	Assessing coastal susceptibility to sea-level rise in Alexandria, Egypt	Abou-Mahmoud, M.M.E.	Egyptian Journal of Aquatic Research	2021	10.1016/j.ejar.2021.04.002	6	An assessment of the susceptibility of Alexandria coastal zone, Egypt, to sea-level rise has been conducted. Alexandria has a vast population and vital activities (industry, fishery, and agriculture) along its coastal zones.
6	Understanding farm-level cognition of and autonomous adaptation to climate variability and associated factors: Evidence from the rice-growing zone of Pakistan	Khan, N.A.; Qiao, J.; Abid, M.; Gao, Q.	Land Use Policy	2021	10.1016/j.landusepol.2021.105427	3	This study was conducted in the rice-growing zone of Punjab province, where rice production is affected by climate variabilities. The study aimed to assess farmers' perception of and adaptation to climate variability and its associated factors.
6	Farmer's perception and factors determining the adaptation decisions to cope with climate change: An evidence from rural India	Jha, C.K.; Gupta, V.	Environmental and Sustainability Indicators	2021	10.1016/j.indic.2021.100112	6	Location: seven districts of the Bihar state of northern India.

6	Perceptions and vulnerability to climate change among the urban poor in Kampala City, Uganda	Twinomuhangi, R.; Sseviiri, H.; Mulinde, C.; Mukwaya, P.I.; Nimusiima, A.; Kato, A.M.	Regional Environmental Change	2021	10.1007/s10113-021-01771-5	6	This paper examines the urban poor's perceptions and vulnerability to climate change in Kampala.
2	Agricultural Land Abandonment in the Hill Agro-ecological Region of Nepal: Analysis of Extent, Drivers and Impact of Change	Subedi, Y.R.; Kristiansen, P.; Cacho, O.; Ojha, R.B.	Environmental Management	2021	10.1007/s00267-021-01461-2	4	Adopting a mixed methods research approach, this study investigated the extent of agricultural land abandonment, its underlying causal drivers and perceived impacts in the hill agro-ecological region of Nepal.
6	Transformational adaptations to climatic hazards: Insights from mangroves-based coastal fisheries dependent communities of Bangladesh	Islam, M.M.; Rahman, M.A.; Khan, M.S.; Mondal, G.; Khan, M.I.	Marine Policy	2021	10.1016/j.marpol.2021.104475	4	This study empirically assesses the transformational adaptation to climatic hazards in two mangrove-dependent coastal fishing communities in Bangladesh: Mathurapur near the Sundarbans, and Batayan near Nijhum Dwip.
6	An informed thought experiment exploring the potential for a paradigm shift in aquatic food production	Kuempel, C.D.; Froehlich, H.E.; Halpern, B.S.	Ocean and Coastal Management	2021	10.1016/j.ocecoaman.2021.105574	4	We undertake a thought experiment that examines trends in these key hypothesized catalysts of the Neolithic Revolution and patterns of today to explore whether society could be on a path towards another paradigm shift in food production: away from hunting of wild fish towards a transition to mostly fish farming.
6	A blue carbon ecosystems qualitative assessment applying the DPSIR framework: Local perspective of global benefits and contributions	Quevedo, J.M.D.; Uchiyama, Y.; Kohsaka, R.	Marine Policy	2021	10.1016/j.marpol.2021.104462	4	To better understand the state changes of blue carbon ecosystems, we collected the drivers and pressures and their impact on the whole coastal ecosystem as well as existing management responses by interviewing 26 stakeholders representing community organizations, non-government organizations, and municipal level government units from two municipalities (Busuanga and Coron) in the island.
2	Understanding spatial and temporal variability of N leaching reduction by winter cover crops under climate change	Teixeira, E.; Kersebaum, K.C.; Ausseil, A.-G.; Cichota, R.; Guo, J.; Johnstone, P.; George, M.; Liu, J.; Malcolm, B.; Khaembah, E.; Meiyalaghan, S.; Richards, K.; Zyskowski, R.; Michel, A.; Sood, A.; Tait, A.; Ewert, F.	Science of the Total Environment	2021	10.1016/j.scitotenv.2020.144770	4	We assess variability and uncertainty of climate change effects on the reduction of N leaching by winter oat cover crops. Field data were collected to quantify ranges of cover crop above-ground biomass (7 to 10 t DM/ha) and N uptake (70 to 180 kg N/ha) under contrasting initial soil conditions.
6	Exploring the influence of climate change and capital assets on livelihood formations in central region of Uganda	Nsubuga, F.N.W.; Mearns, K.F.; Davis, N.C.; Kalumba, A.M.; Komen K.	Environment, Development and Sustainability	2021	10.1007/s10668-020-01020-5	6	Location: Wakiso and Gomba districts, Uganda.
10	Smallholder grain postharvest management in a variable climate: practices and perceptions of smallholder farmers and their service-providers in semi-arid areas	Nyabako, T.; Mvumi, B.M.; Stathers, T.; Machekano, H.	Environment, Development and Sustainability	2021	10.1007/s10668-020-01019-y	4	Our study used a multi-dimensional approach to explore the practices and perceptions of these communities and their service-providers regarding grain postharvest management in semi-arid Mbire and Hwedza districts in Zimbabwe.
6	Environmental Concern in a Capitalist Economy: Climate Change Perception Among U.S. Specialty-Crop Producers	Borlu, Y.; Glenna, L.	Organization and Environment	2021	10.1177/1086026619897545	3	Based on the analysis of the survey data and in-depth interviews with specialty-crop producers in California, New York, Pennsylvania, and Washington, we test the capacity of ecological modernization and treadmill of production perspectives to explain how resource-intensive producers recognize water availability and climate change as threats to their operation's economic viability.
6	Solastalgic Landscapes: Prospects of Relocation in Coastal Louisiana	Simms, J.R.Z.	Frontiers in Environmental Science	2021	10.3389/fenvs.2021.578724	6	This paper elicits and analyzes coastal Louisiana residents' perceptions of socio-environmental changes as they pertain to relocation as adaptation and the precariousness of place, both biophysically and culturally.
6	Combining local knowledge and soil science for integrated soil health assessments in conservation agriculture systems	Hermans, T.D.G.; Dougill, A.J.; Whitfield, S.; Peacock, C.L.; Eze, S.; Thierfelder, C.	Journal of Environmental Management	2021	10.1016/j.jenvman.2021.112192	4	This study, based in Malawi, aims to 1) combine local knowledge and conventional soil science approaches to develop a contextualised understanding of the impact of Conservation Agriculture on soil health; and 2) understand how an integrated approach can contribute to explaining farmer decision-making on land management.
2	Social-ecological interactions in the Draa River Basin, southern Morocco: Towards nature conservation and human well-being using the IPBES framework	Berger, E.; Bossenbroek, L.; Beermann, A.J.; Schäfer, R.B.; Znari, M.; Riethmüller, S.; Sidhu, N.; Kaczmarek, N.; Benaissa, H.; Ghamizi, M.; Plicht, S.; Bem, Salem S.; El, Qorchi F.; Naimi M., Leese, F.; Frör, O.	Science of the Total Environment	2021	10.1016/j.scitotenv.2020.144492	4	In this study, we use the IPBES conceptual framework to combine ecological and socio-economic insights and analyse the connections between people and nature in the water scarce Draa River Basin, southern Morocco. We study the diversity of desert benthic macroinvertebrates as one component of nature using DNA barcoding and their potential to serve as bioindicators of human impact by relating species occurrences to environmental parameters.
6	Rice farming in central java, indonesia—adoption of sustainable farming practices, impacts and implications	Connor, M.; de Guia, A.H.; Pustika, A.B.; Sudarmaji; Kobarsih, M.; Hellin, J.	Agronomy	2021	10.3390/agronomy11050881	6	Location: city of Yogyakarta, Indonesia.
26	Delving into possible missing links for attainment of food security in Central Malawi: farmers' perceptions and long term dynamics in maize (Zea mays L.) production	Nyirenda, H.; Mwangomba, W.; Nyirenda, E.M.	Heliyon	2021	10.1016/j.heliyon.2021.e07130	6	In this study, maize production, area and yield dynamics were assessed based on production data from 2004/05–2018/19 and farmer perceptions using Focus Group Discussions (FGD) in Salima, Central Malawi. A total of 2,400 households (36,000 in 15 years) were sampled each season to estimate the annual maize production dynamics for the district.
10	Perceptions of glacier grafting: An indigenous technique of water conservation for food security in gilgit-baltistan, pakistan	Munir,R.; Khayyam, U.; Adil, I.H.	Sustainability (Switzerland)	2021	10.3390/su13095208	4	This research has studied the impacts of climate change on water availability and the localized indigenous technique of glacier grafting for sustained water provision.
6	Climate change, health risks, and vulnerabilities in burkina faso: A qualitative study on the perceptions of national policymakers	Sorgho, R.; Jungmann, M.; Souares, A.; Danquah, I.; Sauerborn, R.	International Journal of Environmental Research and Public Health	2021	10.3390/ijerph18094972	3	This study identified the perceptions of climate change and health adaptation (CC&H) among relevant stakeholders, decision-makers, and policymakers (SDPs) in Burkina Faso (BF) by determining their perceptions of CC, of related health risks and vulnerabilities, and of CC impacts on agriculture and food security.
6	Determinants of farmers' adaptation decisions under changing climate: the case of Fars province in Iran	Ghazali, S.; Azadi, H.; Kurban, A.; Ajtai, N.; Pietrzykowski, M.; Witlox, F.	Climatic Change	2021	10.1007/s10584-021-03088-y	4	The current study aimed at socio-cognitive perceptions and extended protection motivation theory (PMT) as the basis. This paper estimated the influence of cognitive factors on individuals' views and decisions regarding climate change adaptation.

6	Harmful algal blooms in aquaculture systems in ngerengere catchment, morogoro, tanzania: Stakeholder's experiences and perception	Kimambo, O.N.; Gumbo, J.R.; Chikoore, H.; Msagati, T.A.M.	International Journal of Environmental Research and Public Health	2021	10.3390/ijerph18094928	4	This study aimed at surveying the occurrence, experiences, and perceptions of HABs in aquaculture systems from stakeholders in the Ngerengere catchment, Morogoro, Tanzania.
6	Stakeholder collaboration and irrigation practices in Ghana: issues, challenges, and the way forward	Nalumu, D.J.; Mensah, H.; Amponsah, O.; Takyi, S.A.	SN Applied Sciences	2021	10.1007/s42452-021-04407-9	4	Using the Weija Irrigation Scheme as a case study, this study explores stakeholders' perceptions of collaborative practices in irrigation management by identifying gaps and providing suggestions to enhance stakeholder collaboration.
6	Harnessing scientific and local knowledge to face climate change in small-scale fisheries	Gianelli, I.; Ortega, L.; Pittman, J.; Vasconcellos, M.; Defeo O.	Global Environmental Change	2021	10.1016/j.gloenvcha.2021.102253	4	Based on 40 years of scientific and local ecological knowledge, we provide a coherent narrative about the effects of a marine hotspot of climate change on a small-scale fishery across different geographical and temporal scales. The warming hotspot here analyzed was the fastest-warming region in the South Atlantic Ocean.
6	Climate Change Policy Coherence across Policies, Plans, and Strategies in Pakistan—Implications for the China–Pakistan Economic Corridor Plan	Waheed, A.; Bernward Fischer, T.;,Khan, M.I.	Environmental Management	2021	10.1007/s00267-021-01449-y	4	In this paper, the extent to which Pakistan's national and provincial water, agriculture, and energy sector policies, development plans and strategies are aligned in a climate change policy coherent manner is established. In this context, a qualitative content document analysis with associated scoring is used to assess government documents.
6	Perception of organic farmers towards organic agriculture and role of extension	Alotaibi, B.A.; Yoder, E.; Brennan, M.A.; Kassem, H.S.	Saudi Journal of Biological Sciences	2021	10.1016/j.sjbs.2021.02.037	4	The objectives of this study were to identify the sources used by the organic farmers to gain information related to organic production, and to assess organic farmers' perceived attitudes towards extension services. To address the research objectives, in-depth semi-structured interviews were conducted with 10 organic farmers in central Pennsylvania.
6	Adoption rationales and effects of off-grid renewable energy access for African youth: A case study from Tanzania	Simpson, N.P.; Rabenold, C.J.; Sowman, M.; Shearing, C.D.	Renewable and Sustainable Energy Reviews	2021	10.1016/j.rser.2021.110793	4	This article identifies one emerging response by low-income actors to secure access to through solar photovoltaic energy and an innovative micro-finance enterprise.
26	Perceptions of disaster temporalities in two Indigenous societies from the Southwest Pacific	Jackson, G.	International Journal of Disaster Risk Reduction	2021	10.1016/j.ijdrr.2021.102221	4	This paper explores the perceptions of disaster temporalities within two Indigenous societies in the Southwest Pacific: the Bedamuni of Western Province, Papua New Guinea and Emae Island, Vanuatu. Additionally, disaster management actors' perceptions are explored within Vanuatu.
11	Coping with drought: Narratives from smallholder farmers in semi-arid Kenya	Quandt, A.	International Journal of Disaster Risk Reduction	2021	10.1016/j.ijdrr.2021.102168	4	This paper aims to fill these gaps by examining the human experience of coping with drought through narratives from farmers in Burat and Kinna, Isiolo County, Kenya. This paper highlights (1) their perceived impacts of drought, and (2) the various coping strategies used." Perceptions of drought itself and its impacts, not climate change.
11	Indigenous knowledge of South African bird and rangeland ecology is effective for informing conservation science	Ehlers Smith Y.C.; Maseko, M.S.T.; Sosibo, M.; Dlamini, P.V.; Thobeka Gumede, S.; Ngcobo, S.P.; Tsoananyane, L.; Zungu, M.M.; Ehlers, Smith D.A.; Downs, C.T.	Journal of Environmental Management	2021	10.1016/j.jenvman.2021.112041	4	Using semi-structured interviews, we documented indigenous local ecological knowledge (LEK) held by rural dwellers linked to natural resource utilisation, environmental health and cultural keystone indicator species (CKIS) in the grassland communities of southern KwaZulu-Natal, South Africa. Our main objective was to examine the ability for LEK to inform conservation management.
10	Water appropriation on the agricultural frontier in western Bahia and its contribution to streamflow reduction: Revisiting the debate in the Brazilian cerrado	da Silva, A.L.; de Souza, S.A.; Coelho Filho, O.; Eloy, L.; Salmona, Y.B.; Passos, C.J.S.	Water (Switzerland)	2021	10.3390/w13081054	4	This study aims to understand the implications of the expansion of the agricultural frontier for water resources in western Bahia state.
6	Misperception of cardiometabolic risks and health needs among agriculture and aquaculture workers in Taiwan	Chen M.-Y.,	European Journal of Cardiovascular Nursing	2021	10.1093/eurjcn/zvaa013	4	Few studies have investigated the factors associated with cardiometabolic risks and their perception among these workers. To explore the health needs and perception of cardiometabolic risks and associated factors among agriculture and aquaculture workers. Methods and results A community-based, cross-sectional study design was used. This study was part of a nurse-led health-promotion programme designed to examine the health needs of agriculture and aquaculture workers between March and December 2019 in Yunlin County, Taiwan.
6	Coping with drought: Lessons learned from robusta coffee growers in Vietnam	Byrareddy, V.; Kouadio, L.; Mushtaq, S.; Kath, J.; Stone, R.	Climate Services	2021	10.1016/j.cliser.2021.100229	6	Location: Dak Lak, Dak Nong, Gia Lai and Lam Dong provinces. And Monoculture coffee producers.
6	Farmers and herders reclaim cropland to adapt to climate change in the eastern Tibetan Plateau: a case study in Zamtang County, China	Wu, S.; Yan, J.; Yang, L.; Cheng, X.; Wu, Y.	Climatic Change	2021	10.1007/s10584-021-03098-w	4	This study aimed to investigate the impact of climate change on the decisions of farmers and herders regarding cropland reclamation in the eastern TP, with Zamtang County considered in a case study.
6	The emergence of lotus farming as an innovation for adapting to climate change in the upper vietnamese mekong delta	Vo, H.T.M.; Van Halsema, G.; Hellegers, P.; Wyatt, A.; Nguyen, Q.H.	Land	2021	10.3390/land10040350	4	The present study examines local perceptions of such a system in Dong Thap Province, a lowland, flood-affected area of the upper VMD. Specifically, we explored lotus farming as a potential flood-based adaptive livelihood model for the region.
6	Risk management of marine capture fisheries under climate change: Taking into consideration the effects of uncertainty	Chen, J.-L.; Hsiao, Y.-J.; Yip, K.-K.	Sustainability (Switzerland)	2021	10.3390/su13073892	6	Location: This study selected New Taipei City, Keelung City, and Yilan County as the study areas, with the respondents involved in the coastal and offshore fishing boats or fisheries.
6	Farmers' Demand for Informal Risk Management Strategy and Weather Index Insurance: Evidence from China	Tang, Y.; Cai, H.; Liu, R.	International Journal of Disaster Risk Science	2021	10.1007/s13753-021-00335-9	4	Study explores farmers' demand for weather index insurance, in contrast to informal risk management strategies, and the main factors that affect demand.
2	The risk of the population in a changing climate over the Tibetan Plateau, China: Integrating hazard, population exposure and vulnerability	Ji, Q.; Yang, J.; Wang, C.; Chen, H.; He, Q.; Sun, Z.; Duan, Q.; Li, Y.	Sustainability (Switzerland)	2021	10.3390/su13073633	4	In this paper, the hazard of climate change was assessed from a fresh look, not only considering extreme changes of air temperature, precipitation, and wind speed, but also their changes in mean and fluctuation, using daily meteorological data from 1961–2015. The population exposure and vulnerability to climate change were then evaluated using demographic data and considering population scale and structure.
6	Agricultural climate change and rural animation film application based on remote sensing images	Shen, Z.	Arabian Journal of Geosciences	2021	10.1007/s12517-021-06858-1	4	Remote sensing technology is therefore used to investigate the effects of agricultural climate change and the impact of rural art and culture.
6	Agriculture in boreal and Arctic regions requires an integrated global approach for research and policy	Altdorff, D.; Borchard, N.; Young, E.H.; Galagedara, L.; Sorvali, J.; Quideau, S.; Unc A.	Agronomy for Sustainable Development	2021	10.1007/s13593-021-00676-1	3	To evaluate the current perception of the status of northern agricultural research and the extent to which there is a need for a coordinated approach to its growth, we developed a targeted survey delivered online. Questions are aimed at revealing similarities and discrepancies in the awareness of northern agriculture and obtaining feedback on the need for a global synchronization of research and development. Out of 309 respondents, a curated dataset of 238 respondents was employed for analysis. This included respondents with knowledge and expertise in boreal and/or Arctic agriculture (41%), of temperate and/or alpine agriculture (37%), and other respondents (22%).

6	Understanding climate services for enhancing resilient agricultural systems in Anglophone West Africa: The case of Ghana	Antwi-Agyei, P.; Dougill, A.J.; Doku-Marfo, J.; Abaidoo, R.C.	Climate Services	2021	10.1016/j.cliser.2021.100218	3	This paper determines how climate information services have been incorporated into national policies by Anglophone West African states for building agricultural resilience and provides a detailed analysis of issues facing Ghanaian agricultural systems.
6	Livelihood vulnerability index: a pragmatic assessment of climatic changes in flood affected community of Jhok Reserve Forest, Punjab, Pakistan	Shahzad, L.; Shah, M.; Saleem, M.; Mansoor, A.; Sharif, F.; Tahir, A.; Hayyat, U.; Farhan, M.; Ghafoor, G.	Environmental Earth Sciences	2021	10.1007/s12665-021-09562-1	4	The study assessed the underline causes of livelihood vulnerability in a flood prone rural area surrounded by riverine Jhok Reserve forest of Punjab Province. Using Livelihood Vulnerability Index (LVI), eight potential components were inquired from two hundred natural-resource dependent households.
6	Rootstocks with different vigor influenced scion–water relationships and stress responses in ambrosiatm apple trees (Malus domestica var. ambrosia)	Xu, H.; Ediger, D.	Plants	2021	10.3390/plants10040614	4	This study aimed to set the first step towards a much-needed comprehensive evaluation on water relationships and stress responses of scion–rootstock systems for the popular apple cultivar Ambrosia™ (Malus domestica var. Ambrosia), because its production and horticultural knowledge had been largely lim-ited to the Malling 9 rootstock (M.9).
2	Perception of climate change and adaptation strategies in tea plantations of Assam, India	Baruah, P.; Handique, G.	Environmental Monitoring and Assessment	2021	10.1007/s10661-021-08937-y	2	Based on a questionnaire survey carried out in four major tea-growing regions of Assam, viz., Upper Assam, South Bank, North Bank and Cachar, the study analyses tea growers' awareness of climate change, its impact on tea, adaptive approaches undertaken and future strategies.
10	Nutritional diversity and community perceptions of health and importance of foods in Kiribati: a case study	Cauchi, J.P., Bambrick, H., Moncada, S., Correa-Velez, I.	Food Security	2021	10.1007/s12571-020-01128-6	4	Study about diseases.
2	A typology of climate information users for adaptation to agricultural droughts in Uruguay	Cruz, G.; Gravina, V.; Baethgen, W.E.; Taddei, R.	Climate Services	2021	10.1016/j.cliser.2021.100214	4	Using the case of agricultural droughts in livestock systems of Uruguay, this paper analyzes the extent in which available climate information is being used for adaptation to droughts.
2	What if the rains do not come?	Ndehedehe, C.E.; Ferreira, V.G.; Agutu, N.O.; Onojeghuo, A.O.; Okwuashi, O.; Kassahun, H.T.; Dewan, A.	Journal of Hydrology	2021	10.1016/j.jhydrol.2021.126040	4	To guide future expectations about droughts, this study aims to assess large-scale variability of hydrological stores (groundwater, soil moisture, and surface water) and their responses to drought intensities over large semi-arid domains in Australia.
11	Whose expertise counts? Assisted migration and the politics of knowledge in British Columbia's public forests	Pelai, R.; Hagerman, S.M.; Kozak, R.	Land Use Policy	2021	10.1016/j.landusepol.2021.105296	3	In this study, we use a politics of knowledge lens applied to the case of British Columbia, Canada, where Assisted Migration (AM) policy is currently in place, to examine the types of knowledge informing AM thus far, and how that knowledge shapes perceived AM risks and ways of addressing them. Based on 27 in-depth, semi-structured interviews with key government employees and forest industry professionals involved with the development and implementation of AM, we find an overall optimistic view of AM.
6	Institutional challenges and stakeholder perception towards planned water reuse in peri-urban agriculture of the Bengal delta	Haldar, K.; Kujawa-Roeleveld, K.; Schoenmakers, M.; Datta, D.K.; Rijnaarts, H.; Vos, J.	Journal of Environmental Management	2021	10.1016/j.jenvman.2021.111974	6	This paper aims to assess the level of awareness, perception, and willingness of different stakeholders toward current practices and the prospect of urban water reuse in Khulna City - one of the most vulnerable cities located in the southwest of Bangladesh due to the consequences of rapid climate changes in the Bengal delta.
6	Farm households' perception of weather change and flood adaptations in northern Pakistan	Aftab, A.; Ahmed, A.; Scarpa, R.	Ecological Economics	2021	10.1016/j.ecolecon.2020.106882	6	Location: This research investigates farm households' adaptations to climate change-driven monsoon floods in the rural district of Nowshera, Pakistan.
6	A leverage points analysis of a qualitative system dynamics model for climate change adaptation in agriculture	Egerer, S.; Cotera, R.V.; Celliers, L.; Costa, M.M.	Agricultural Systems	2021	10.1016/j.agsy.2021.103052	4	We developed a novel method to identify leverage points for effective climate change adaptation measures. We applied this method to analyze opportunities for climate change adaptation within the agricultural sector in Northeast Lower Saxony, Germany.
11	Rural farmers perception and coping strategies towards climate change and their determinants: Evidence from Khyber Pakhtunkhwa province, Pakistan	Ali, S.; Ying, L.; Nazir, A.; Abdullah; Ishaq, M.; Shah, T.; Ye, X.; Ilyas, A.; Tariq, A.	Journal of Cleaner Production	2021	10.1016/j.jclepro.2020.125250	3	This population is not small scale. Agriculture, trade and public services are the main sources of income in this province. In the Agriculture sector, many important crops are grown in the province.
6	Convergence of stakeholders' environmental threat perceptions following mass coral bleaching of the Great Barrier Reef	Thiault, L.; Curnock, M.I.; Gurney, G.G.; Heron, S.F.; Marshall, N.A.; Bohensky, E.; Nakamura, N.; Pert, P.L.; Claudet, J.	Conservation Biology	2021	10.1111/cobi.13591	3	Research examining how threat perceptions are shared or diverge among stakeholder groups and how these can evolve through time is increasingly important. We investigated environmental threat perceptions related to Australia's Great Barrier Reef and explored their associations before and after consecutive years of mass coral bleaching. We used data from surveys of commercial fishers, tourism operators, and coastal residents (n = 5254) conducted in 2013 and 2017.
6	Diversified responses to contemporary pressures on sloping agricultural land: Thai farmer's perception of mountainous landscapes in northern Vietnam	Nguyen, A.T.; Hens L.	Environment, Development and Sustainability	2021	10.1007/s10668-020-00822-x	4	This study deals with understanding the pressures driving the changes, the new state of the upland agriculture, and the way the Thai of the Son Thinh mountain (Yen Bai, Vietnam) respond to sustain their upland farming systems.
6	Perceptions and sustainable actions under land degradation and climate change: the case of a remnant wetland in Mexico City	Gómez Aíza, L.; Ruíz Bedolla, K.; Low-Pfeng, A.M.; Vallejos, Escalona L.M.L.; García-Meneses, P.M.	Environment, Development and Sustainability	2021	10.1007/s10668-020-00800-3	3	We documented the perceptions of nonresidents that are involved in decision making in the Lacustrine Zone of Xochimilco (LZX) in terms of degradation and climate change impacts and their opinions on the actions that could help strengthen the resilience of this area.
6	The 5As: assessing access to animal-drawn conservation agriculture planting equipment by smallholder farmers	Mugandani, R.; Mafongoya, P.	Environment, Development and Sustainability	2021	10.1007/s10668-020-00795-x	4	The objective of this study was to evaluate access to animal-drawn Conservation Agriculture planting equipment by smallholder farmers in Chivi, Murehwa and Mutoko districts located in different agro-ecological zones of Zimbabwe using the 5As framework of access: acceptability, accessibility, affordability, awareness and availability.
2	Projected drought risk assessment from water balance perspectives in a changing climate	Park, S.-Y.; Sur, C.; Kim, J.-S.; Choi, S.-J.; Lee, J.-H.; Kim, T.-W.	International Journal of Climatology	2021	10.1002/joc.6988	3	We propose a quantitative approach to identify high drought risk areas in South Korea by applying future climate and socio-economic change scenarios to calculate the demand and supply of municipal, agricultural, and industrial water.
6	Bioeconomy as a transforming driver of intensive greenhouse horticulture in SE Spain	Egea, F.J.; López-Rodríguez, M.D.; Oña-Burgos, P.; Castro, A.J.; Glass, C.R.	New Biotechnology	2021	10.1016/j.nbt.2020.11.010	4	This article describes the potential for the agri-food supply chain to drive the transition of medium and low-tech intensive greenhouse systems to biobased, circular economy value-chains.
6	Preliminary assessment and conservation of insect pollinators through community participation in the Lahaul and Spiti district of Himachal Pradesh, India	Chauhan, M.; Uniyal, V.P.; Chandra, A.; Thakur, P.; Mehrwar, V.	Current Science	2021	10.18520/cs/v120/i5/883-887	4	This study was conducted in the Indian Trans-Himalayan Region (THR). Major Insect pollinators taxa have been selected to identify the important contributors in the pollination services.
6	Local farmer's perception and adaptive behavior toward climate change	Guo, R.; Li, Y.; Shang, L.; Feng, C.; Wang, X.	Journal of Cleaner Production	2021	10.1016/j.jclepro.2020.125332	3	This study develops a binary logistic regression (BLR) model to explore the underlying principles of local farmer's perception and adaptive behavior toward climate change, with a focus on influential farmers (117 head farmers from 89 farmers' cooperatives in Chongming Island of China - the largest alluvial island in the world).

6	Climate change perceptions and the adoption of low-carbon agricultural technologies: Evidence from rice production systems in the Yangtze River Basin	Li, W.; Ruiz-Menjivar, J.; Zhang, L.; Zhang, J.	Science of the Total Environment	2021	10.1016/j.scitotenv.2020.143554	3	Using a sample of 1115 rice farmers, we explored climate change perceptions, adoption of agricultural low-carbon technologies (LCTs), and the determinants influencing rice farmers' climate change adaptation in the Yangtze River Basin (YRB), central China.
2	Risk assessment of coastal flooding under different inundation situations in southwest of taiwan (Tainan city)	Imani, M.; Kuo, C.-Y.; Chen, P.-C.; Tseng, K.-H.; Kao, H.-C.; Lee, C.-M.; Lan, W.-H.	Water (Switzerland)	2021	10.3390/w13060880	6	In this study, a simulation of the static flooding situation in the southwest coast of Taiwan (Tainan city) at the end of this century was conducted by using a combination of the Taiwan Digital Elevation Model (DEM), regional sea level changes reconstructed by tide gauge and altimetry data, vertical land deformation derived from leveling and GPS data, and ocean tide models.
6	Farmers' perceptions towards climate change and its adaptation strategies in himachal pradesh	Rani, S.; Prasher, R.S.	Indian Journal of Economics and Development	2021	10.35716/IJED/20168	3	The study was undertaken to understand the farmers' point of view about climate change and its impacts on agriculture and various adaptation strategies to deal with climate change in the Hamirpur district of Himachal Pradesh. The abstract does not mention if the farmers are smallholders.
6	Engineering cereal crops for enhanced abiotic stress tolerance	Lata, C.; Shivhare, R.	Proceedings of the Indian National Science Academy	2021	10.1007/s43538-021-00006-9	4	Article about agricultural biotechnology including genomics-assisted breeding and genetic engineering.
6	Psychological dimensions of climate change: perceptions, collective efficacy, and responses in Berehet District, north Shoa, Ethiopia	Ayal, D.Y.; Tilahun, K.; Ture, K.; Terefe Zeleke, T.	Climatic Change	2021	10.1007/s10584-021-03033-z	3	Twenty two key informants comprising twelve development agents (crop, livestock and natural resource Das in each PA), one district crop experts, one district livestock experts, five lead farmers, and three PA watershed management committee representatives were purposely selected due to their better undersigning the impact of climate on agriculture and individual and collective climate change response.
2	'None of my ancestors ever discussed this disease before!' How disease information shapes adaptive capacity of marginalised rural populations in India	Asaaga, F.A.; Rahman, M.; Kalegowda, S.D.; Mathapati, J.; Savanur, I.; Srinivas, P.N.; Seshadri, T.; Narayanswamy, D.; Kiran, S.K.; Oommen, M.A.; Young, J.C.; Purse, B.V.	PLoS Neglected Tropical Diseases	2021	10.1371/journal.pntd.0009265	4	This paper addresses this gap by exploring the role of disease information in shaping the adaptive capacity of smallholder farmer and tribal groups to Kyasanur Forest Disease (KFD), a tick-borne viral haemorrhagic fever.
10	Seasonality, climate change, and food security during pregnancy among indigenous and non-indigenous women in rural Uganda: Implications for maternal-infant health	Bryson, J.M.; Patterson, K.; Berrang-Ford, L.; Lwasa S.; Namanya, D.B.; Twesigomwe, S.; Kesande, C.; Ford, J.D.; Harper, S.L.; Llanos, A.; Carcamo, C.; Namanya, D.; Ford, J.; Berrang-Ford L.; Garcia, P.; Lwasa, S.; Edge, V.; Indigenous Health Adaptation to Climate Change Research Team.	PLoS ONE	2021	10.1371/journal.pone.0247198	4	This study examined pathways through which climate change influenced food security during pregnancy among Indigenous and non-Indigenous women in rural Uganda.
6	Exploring cross-national public support for the use of enhanced weathering as a land-based carbon dioxide removal strategy	Spence, E.; Cox, E.; Pidgeon, N.	Climatic Change	2021	10.1007/s10584-021-03050-y	6	This study explores how public attitudes across three countries influence support towards terrestrial enhanced weathering, whereby silicate minerals are applied to agricultural land to remove carbon dioxide from the atmosphere. An online survey was administered in Australia (N = 1000), the UK (N = 1000), and the USA (N = 1026).
2	The 3ps (Profit, planet, and people) of sustainability amidst climate change: A south african grape and wine perspective	Gbejewoh, O.; Keesstra, S.; Blancquaert, E.	Sustainability (Switzerland)	2021	10.3390/su13052910	4	This paper aims to review the current state of knowledge with regards to the three pillars of sustainability and with regards to climate change.
2	Willingness of farmers to establish a renewable energy (solar and wind) cooperative in NW Turkey	Everest, B.	Arabian Journal of Geosciences	2021	10.1007/s12517-021-06931-9	4	This study was conducted to investigate farmers' desire to benefit from renewable energy (solar and wind) in northwestern provinces in Turkey.
6	Climate change vulnerability assessment for selected agricultural responses at Yarmouk River Basin Area, Jordan	Al Qudah, A.; Rusan, M.J.; Al-Qinna, M.I.; Abdulla, F.A.	Mitigation and Adaptation Strategies for Global Change	2021	10.1007/s11027-021-09944-7	4	This study aimed at providing a comprehensive climate change vulnerability assessment of four agriculture responses of barley production, wheat production, olive trees production, and goats' mortality at the Yarmouk River Basin in northern Jordan using a qualitative-quantitative scoring method based on actual estimations of exposure, sensitivity, and adaptive capacity with an emphasis on community engagement.
2	The role of short-term changes in cognitive capacity on economic expenditure among Kenyan agro-pastoralists	Iles, R.A.; Surve, A.; Kagundu, S.; Gatumu, H.	PLoS ONE	2021	10.1371/journal.pone.0247008	4	The present research empirically evaluates the drivers of short-term changes in cognitive capacity-cognitive ability and heuristic use-and its effect on crop and livestock expenditure among predominantly poor Kenyan agro-pastoralists
6	Household perspective on cropland expansion on the Tibetan Plateau	He, X.; Yan, J.; Cheng, X.	Regional Environmental Change	2021	10.1007/s10113-021-01752-8	2	Using the Pumqu River Basin (PRB) in the Tibetan Plateau as the study area, we constructed a conceptual model that emphasizes the role of households and explored the causes of cropland expansion based on field survey data.
2	Impact of environmental changes on Dermatology	Junior, V.H.; Mendes, A.L.; Talhari, C.C.; Miot, H.A.	Anais Brasileiros de Dermatologia	2021	10.1016/j.abd.2020.11.004	4	In this article, aspects related to deforestation, fires, urbanization, large-scale agriculture, extensive livestock farming, pollution and climatic changes are discussed regarding their influence on the epidemiology of skin diseases.
11	Changing environment and development institutions to enable payments for ecosystem services: The role of institutional work	Thompson, B.S.; Harris, J.L.	Global Environmental Change	2021	10.1016/j.gloenvcha.2021.102227	4	This article investigates how actors have attempted institutional change to enable PES, by reinterpreting or adapting national laws, policies, and plans.
6	Planning for the health impacts of climate change: Flooding, private groundwater contamination and waterborne infection – A cross-sectional study of risk perception, experience and behaviours in the Republic of Ireland	Musacchio, A.; Andrade, L.; O'Neill, E.; Re, V.; O'Dwyer, J.; Hynds, P.D.	Environmental Research	2021	10.1016/j.envres.2021.110707	3	The current study sought to quantify the capacity of private well users to cope with flood-triggered contamination risks and identify the social psychological determinants of proactive attitudes in the Republic of Ireland, using a cross-sectional questionnaire incorporating two distinct models of health behaviour, the Health Belief Model and Risk-Attitude-Norms-Ability-Self Regulation model.

6	Modelling transformational adaptation to climate change among crop farming systems in Romagna, Italy	Zagaria, C.; Schulp, C.J.E.; Zavalloni, M.; Viaggi, D.; Verburg, P.H.	Agricultural Systems	2021	10.1016/j.agsy.2020.103024	6	We explore this modelling potential and aim to quantify (1) how climate change, farmer behavior and water policies may influence strategic adaptation decision-making at the farm-level, (2) the extent to which implemented adaptations represent transformations, and (3) their impact on farm structure and wider socio-ecological change. We investigate these aims through a case study of crop farming systems in the drought-prone historical region of Romagna (NE Italy), integrating insight from stakeholder interviews, local reports, spatially-explicit biophysical data and behavioral theory in the construction of an agent-based model.
2	Healthy waterways and ecologically sustainable cities in Beijing-Tianjin-Hebei urban agglomeration (northern China): Challenges and future directions	Kattel, G.; Reeves, J.; Western, A.; Zhang, W.; Jing, W.; McGowan, S.; Cuo, L.; Scales, P.; Dowling, K.; He, Q.; Wang, L.; Capon, S.; Pan, Z.; Cui, J.; Zhang, L.; Xiao, L.; Liu, C.; Zhang, K.; Gao C.; Tian, Z.; Liu, Y.	Wiley Interdisciplinary Reviews: Water	2021	10.1002/wat2.1500	6	Location: The cities across the northern dry region of China: Beijing-Hebei-Tianjin (BTH) urban agglomeration.
6	Prolonged duration and increased severity of agricultural droughts during 1978 to 2016 detected by ESA CCI SM in the humid Yunnan Province, Southwest China	Ma, S.; Zhang, S.; Wang, N.; Huang, C.; Wang, X.	Catena	2021	10.1016/j.catena.2020.105036	4	Based on revised global multi-source microwave-based SM products, the European Space Agency's Climate Change Initiative Soil Moisture (ESA CCI SM) data, the 10-day-scale soil moisture (SM) series was constructed and applied to detect droughts and analyze changes in drought characteristics, including duration, area, frequency, intensity, and severity.
6	Reconciling sustainability, economic efficiency and equity in marine fisheries: Has there been progress in the last 20 years?	Cochrane, K.L.	Fish and Fisheries	2021	10.1111/faf.12521	4	This paper reviews the progress made over the last 20 years in achieving sustainable, economically efficient and socially just marine fisheries, referred to here as reconciled fisheries. It examines the substantial changes that have occurred in policies, practices and the challenges to fisheries
6	Farmers' perception and adaptations to climate change: findings from three agro-ecological zones of Punjab, Pakistan	Ali, M.F.; Rose, S.	Environmental Science and Pollution Research	2021	10.1007/s11356-020-11472-x	3	Location: Punjab, Pakistan. The abstract does not mention if they are dealing with smallholders.
6	A Changing Climate in the Maple Syrup Industry: Variation in Canadian and U.S.A. Producers' Climate Risk Perceptions and Willingness to Adapt Across Scales of Production	Caughron, A.; Legault, S.; Haut, C.; Houle, D.; Reynolds, T.W.	Small-scale Forestry	2021	10.1007/s11842-020-09457-2	2	Study about maple syrup production ("maple sugaring") in eastern Canada and the northeastern United States (U.S.A.).
6	Insight and explore farming adaptation measures to support sustainable development goal 2 in the southwest coastal region of Bangladesh	Akter, S.; Ahmed, K.R.	Environment, Development and Sustainability	2021	10.1007/s10668-020-00778-y	3	Does not specify whether it is smallholder. The study evaluated farmers' perception on climate-related hazards, climate variables and factors. Eight focus group discussions, 200 household surveys and six key informant interviews were carried out to receive farmers' perception on climate change and impacts of agriculture.
6	Farmers' adaptation to climate-smart agriculture (CSA) in NW Turkey	Everest, B.	Environment, Development and Sustainability	2021	10.1007/s10668-020-00767-1	4	The present study was conducted to put forth farmers' adaptation of climate change.
6	Stocktaking of local adaptation plans and initiatives in the changing political context in Nepal	Maharjan, S.K.	Environment, Development and Sustainability	2021	10.1007/s10668-020-00713-1	3	This paper explores the opinions and perceptions of climate experts on the local adaptation plans in the changing political context in Nepal.
6	Causal Loop Diagrams for supporting Nature Based Solutions participatory design and performance assessment	Coletta, V.R.; Pagano, A.; Pluchinotta, I.; Fratino, U.; Scrieciu, A.; Nanu, F.; Giordano, R.	Journal of Environmental Management	2021	10.1016/j.jenvman.2020.111668	4	The present research aims to propose a shift in the approach to Nature Based Solutions design, based on the early stakeholders' involvement in the identification, modelling and performance assessment in terms of benefits and, particularly, co-benefits production.
10	An assessment of perceived participatory climate change adaptation initiatives in Ghana	Nunoo, E.K.; Twum, E.K.; Panin, A.; Essien, B.A.	Management of Environmental Quality: An International Journal	2021	10.1108/MEQ-05-2020-0096	3	Purpose: This paper presents assessment results on the level of perceived knowledge in climate change and the extent to which participatory awareness in adaptation initiatives by management and the public in key selected areas identified to be highly impacted by climate change has fared. Purposive sampling was used to identify 80 management respondents (MRs) from a target population of 170 in the Ministry of Lands and Natural Resources, Ministry of Environment, Science, Technology and Innovations, Ministry of Fisheries, Ministry of Education, Forestry Commission, Environmental Protection Agency, academia and NGOs
2	Potential of biochar derived from crop residues in soil remediation and controlling air pollution due to stubble burning	Choudhary, M.P.; Charan, H.D.; Acharya, B.	Indian Journal of Environmental Protection	2021	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85110634676&partnerID=40&md5=b2e36b641166f88ff5bf737f1496c192	4	This paper, it has been tried to summarize the research done so far alongwith a critical assessment of various studies and their findings to help decide upon the future course of research and action, especially in Indian context where agricultural waste is produced in large quantities and its disposal creates environmental air pollution when burnt in open fields.
2	Exploring assumptions in crop breeding for climate resilience: opportunities and principles for integrating climate model projections	Whitfield, S.; Chapman, S.; Mahop, M.T.; Deva, C.; Masamba, K.; Mwamahonje, A.	Climatic Change	2021	10.1007/s10584-021-02997-2	3	In this paper, we characterise efforts to breed new varieties of crops for climate resilience in southern Africa and evaluate the extent to which climate model projections currently inform crop breeding activity.
6	Grapevine rootstocks differently affect physiological and molecular responses of the scion under water deficit condition	Prinsi, B.; Simeoni, F.; Galbiati, M.; Meggio, F.; Tonelli, C.; Scienza, A.; Espen, L.	Agronomy	2021	10.3390/agronomy11020289	4	The present work evaluated the performance of the 101.14 and M4 rootstocks in graft combination with the cultivar Cabernet Sauvignon (Cab) by assessing some of the canonical molecular, biochemical and physiological responses induced by Water Deficiency.
2	Guidelines for co-creating climate adaptation plans for fisheries and aquaculture	Pham, T.T.T.; Friðriksdóttir, R.; Weber, C.T.; Viðarsson, J.R.; Papandroulakis, N.; Baudron, A.R.; Olsen, P.; Hansen, J.A.; Laksá, U.; Fernandes, P.G.; Bahri, T.; Ragnarsson, S.Ö.; Aschan M.	Climatic Change	2021	10.1007/s10584-021-03041-z	4	This paper introduces guidelines for the development of climate adaptation plans (CAPs) within fisheries and aquaculture, applying a co-creation approach that requires the participation of scientists, industry representatives, policymakers, and other relevant stakeholders. The objective is to provide a stepwise approach to facilitate and enable stakeholders to plan strategies toward climate adaptation.
2	Livelihood diversification strategies and resilience to climate change in semi-arid northern Ghana	Mohammed, K.; Batung, E.; Kansanga, M.; Nyantakyi-Frimpong, H.; Luginaah, I.	Climatic Change	2021	10.1007/s10584-021-03034-y	4	Drawing data from a cross-sectional survey with 1100 smallholder households in semi-arid northern Ghana, this study contributes to the literature by examining the association between livelihood diversification and climate change resilience.

6	Farmer views on climate change—a longitudinal study of threats, opportunities and action	Sorvali, J.; Kaseva, J.; Peltonen-Sainio, P.	Climatic Change	2021	10.1007/s10584-021-03020-4	3	This study aimed to understand farmers' climate change views and reveal how farmers see their role, responsibilities and possibilities to mitigate and adapt to climate change. Furthermore, this study aimed to assess how various background variables and values associate with farmers' views in order to have novel and comprehensive on farmers' perspectives on climate change. In total, 4401 farmers in Finland answered a standardized e-mail survey in spring 2018.
6	Integrating stakeholders' perspectives and spatial modelling to develop scenarios of future land use and land cover change in northern Tanzania	Kariuki, R.W.; Munishi, L.K.; Courtney-Mustaphi, C.J.; Capitani, C.; Shoemaker, A.; Lane, P.J.; Marchant, R.	PLoS ONE	2021	10.1371/journal.pone.0245516	4	We use a participatory modelling tool, Kesho, to assess the biophysical, socioeconomic, cultural and governance factors that influenced past (1959–1999) and present (2000–2018) land use and land cover change (LULCC) in northern Tanzania and to simulate four scenarios of land cover change to the year 2030.
2	Re-framing the threat of global warming: an empirical causal loop diagram of climate change, food insecurity and societal collapse	Richards, C.E.; Lupton, R.C.; Allwood, J.M.	Climatic Change	2021	10.1007/s10584-021-02957-w	4	This paper aims to identify and structure an empirical evidence base of the climate change, food insecurity and societal collapse pathway. We first review the societal collapse and existential risk literature and define a set of determinants of societal collapse.
6	German farmers' perspectives on price drivers in agricultural land rental markets—a combination of a systematic literature review and survey results	von Hobe, C.-F.; Michels, M.; Musshoff, O.	Land	2021	10.3390/land10020180	3	This study combines de-scriptive results from a survey with 156 German farmers conducted during 2019–2020 using purposive sampling and a systematic literature review.
2	The role of certification, risk and time preferences in promoting adoption of climate-resilient citrus varieties in Indonesia	Hasibuan, A.M.; Gregg, D.; Stringer, R.	Climatic Change	2021	10.1007/s10584-021-03015-1	4	We used a recently developed survey-based tool for measuring risk and time preferences and link those to stated preferences and observations on the adoption of certified seedlings.
6	Influence of heat stress on milk production and its financial implications in semi-arid areas of South Africa	Ogundeji, A.A.; Lakew, H.; Tesfuhuney, W.; Lombard, W.	Heliyon	2021	10.1016/j.heliyon.2021.e06202	4	This study analysed the financial implications of heat stress for small scale milk producers.
2	Low flow and drought in a german low mountain range basin	Grosser, P.F.; Schmalz, B.	Water (Switzerland)	2021	10.3390/w13030316	4	This paper seeks to investigate low flow and drought in an integrative catchment approach by observing the historical development of low flows and drought in a typical German low mountain range basin in the federal state of Hesse for the period 1980 to 2018.
6	Investigation of the optimum planting dates for maize varieties using a hybrid approach: A case of Hwedza, Zimbabwe	Mugiyo, H.; Mhizha, T.; Chimonyo, V.G.P.; Mabhaudhi, T.	Heliyon	2021	10.1016/j.heliyon.2021.e06109	2	The study's objective was to use a hybrid approach to determine the best planting windows and maize varieties.
6	Food for thought: Addressing urban food security risks through urban agriculture	Steenkamp, J.; Cilliers, E.J.; Cilliers, S.S.; Lategan, L.	Sustainability (Switzerland)	2021	10.3390/su13031267	6	Urban agriculture is proposed as a potential method of intervention for planners to support sustainable food production and supply chains. The paper utilized a multiple-case study design to analyze four best practice examples of urban agriculture in the Global South to uncover its potential to address food security associated risks and contribute to sustainable development objectives.
2	Key factors affecting the adoption willingness, behavior, and willingness-behavior consistency of farmers regarding photovoltaic agriculture in China	Li, B.; Ding, J.; Wang, J.; Zhang, B.; Zhang, L.	Energy Policy	2021	10.1016/j.enpol.2020.112101	4	The goal of this study was to analyze the key factors that influence the willingness, behavior, and willingness-behavior consistency of farmers to adopt photovoltaic agriculture.
6	Knowledge, attitudes, and practices on climate change and dengue in Lao People's Democratic Republic and Thailand	Rahman, M.S.; Overgaard, H.J.; Pientong, C.; Mayxay, M.; Ekalaksananan, T.; Aromseree, S.; Phanthanawiboon, S.; Zafar, S.; Shipin, O.; Paul, R.E.; Phommachanh, S.; Pongvongsa, T.; Vannavong, N.; Haque, U.	Environmental Research	2021	10.1016/j.envres.2020.110509	4	The present study was conducted to determine the knowledge, attitudes, and practices (KAP) among urban and rural communities and government officials about climate change and dengue in Laos and Thailand.
6	Climate change impacts on household food security and adaptation strategies in southern Ethiopia	Mekonnen, A.; Tessema, A.; Ganewo, Z.; Haile, A.	Food and Energy Security	2021	10.1002/fes3.266	4	We therefore analyzed local climatic changes, the status of household food security, climate-related causes of food insecurity, food security determinants, and the adaptation strategies of local farmers.
6	Identifying economic and societal drivers of engagement in agri-environmental schemes for English dairy producers	Coyne, L.; Kendall, H.; Hansda, R.; Reed, M.S.; Williams, D.J.L.	Land Use Policy	2021	10.1016/j.landusepol.2020.105174	6	This study focused exclusively on a small number of commercial dairy producers located in the North West of England who were all suppliers of a global food producer and members of the producer's own private AES.
6	Bringing farmers' perceptions into science and policy: Understanding salinity tolerance of rice in southwestern Bangladesh under climate change	Islam, M.A.; Shelia, V.; Ludwig, F.; de Bruyn, L.L.; Rahman, M.H.U.; Hoogenboom, G.	Land Use Policy	2021	10.1016/j.landusepol.2020.105159	2	The objective of this study was to assess the salinity tolerance threshold for Boro season rice cultivation in the southwestern coastal areas of Bangladesh based on farmers' perceptions of salinity problem.
6	Who benefits from climate-friendly agriculture? The marginal returns to a rainfed system of rice intensification in Tanzania	Sarr, M.; Bezabih Ayele, M.; Kimani, M.E.; Ruhinduka, R.	World Development	2021	10.1016/j.worlddev.2020.105160	2	This study assesses the impacts of a modified, rainfed variant of the system of rice intensification (SRI) on expected yields, yield variance (variability) and yield skewness (exposure to downside risk) in Tanzania.
2	Will Evolving Climate Conditions Increase the Risk of Floods of the Large U.S.-Canada Transboundary Richelieu River Basin?	Lucas-Picher, P.; Lachance-Cloutier, S.; Arsenault, R.; Poulin, A.; Ricard, S.; Turcotte, R.; Brissette, F.	Journal of the American Water Resources Association	2021	10.1111/1752-1688.12891	4	To assess the impacts of climate change on flood risks of the LCRR basin, three bias-corrected multi-resolution ensembles of climate projections for two greenhouse gas concentration scenarios were used to force a state-of-the-art, high-resolution, distributed hydrological model.
2	Dilemmas of integrated water resources management implementation in the Awash River Basin, Ethiopia: irrigation development versus environmental flows	Mersha, A.N.; de Fraiture, C.; Masih, I.; Alamirew, T.	Water and Environment Journal	2021	10.1111/wej.12638	4	This paper analyses socio-political issues and effects of environmental flows integration on water availability under the context of increased agricultural intensification in an effort to tackle food insecurity.
6	Farmers' perception of climate change compared with objective data: Evidence from the central region of ghana	Dadzie, S.K.N.	Climate Change Economics	2021	10.1142/S2010007820500153	3	The population of the study was food crop farmers in the Central Region of Ghana who have been in the farming business for at least 20 years.
6	Climate Risk and Technology Adoption in the Midstream of Crop Value Chains: Evidence from Nigerian Maize Traders	Liverpool-Tasie, L.S.O.; Parkhi, C.M.	Journal of Agricultural Economics	2021	10.1111/1477-9552.12394	2	We explore how climate events and risk perceptions affect the adoption of value-adding and damage control strategies among maize traders in Nigeria, Africa's largest economy and most populous country.

6	Climate change vulnerability of rural households in flood-prone areas of Himalayan foothills, West Bengal, India	Ghosh, M.; Ghosal, S.	Environment, Development and Sustainability	2021	10.1007/s10668-020-00687-0	4	The primary aim of the present study is to find out whether there are any differences between levels of vulnerability amidst agriculture-dependent villages and forest resource-dependent villages in the same flood-prone area or not.
6	Insight into farmers' agricultural adaptive strategy to climate change in northern Bangladesh	Islam, A.R.M.T.; Shill, B.K.; Salam, R.; Siddik, M.N.A.; Patwary, M.A.	Environment, Development and Sustainability	2021	10.1007/s10668-020-00681-6	4	The present study aimed to identify the adopted strategies by the farmers and contributing factors that affected the adaptation strategies in the northern region of Bangladesh
6	What shapes farmers' perception of climate change? A case study of southern Brazil	Foguesatto, C.R.; Machado, J.A.D.	Environment, Development and Sustainability	2021	10.1007/s10668-020-00634-z	2	This study analyzes the factors that influence farmers' perception of climate change. Data were collected from a farm-household survey in the Rio Grande do Sul state, Brazil. The empirical data used were generated from a farm-level survey applied to farmers' soybean producers who declared themselves as the main decision maker of the farm.
6	Bioeconomy development factors in the European Union and Poland	Woźniak, E.; Tyczewska, A.; Twardowski, T.	New Biotechnology	2021	10.1016/j.nbt.2020.07.004	4	The present study discusses factors for bioeconomy development through an analysis of their social, economic and environmental aspects, as well as showing the value of the selected indicators in the EU and Poland.
6	Discriminated perceptions of climatic impacts on coastal farm management practices	Hasan, M.K.; Kumar, L.	Journal of Environmental Management	2021	10.1016/j.jenvman.2020.111550	3	The aim of this study was to investigate the changes in coastal farm management in Bangladesh over the last decade compared to the previous one. We explored whether the causes of those changes were climatic or non-climatic as perceived by the farmers and the factors that shaped their perceptions. We interviewed 381 farmers sampled from ten subdistricts along the coast of Bangladesh.
6	Environmental and nutritional profile of food consumption patterns in the different climatic zones of Spain	Esteve-Llorens, X.; Van Dooren, C.; Álvarez, M.; Moreira, M.T.; Feijoo, G.; González-García, S.	Journal of Cleaner Production	2021	10.1016/j.jclepro.2020.123580	4	the main goal of this study is to identify variations in food consumption patterns in terms of greenhouse gas emissions and nutritional intake adequacy for the 5 climatic zones of Spain.
17	Traditional knowledge and institutions for sustainable climate change adaptation in Ethiopia	Mekonnen, Z.; Kidemu, M.; Abebe, H.; Semere, M.; Gebreyesus, M.;Worku, A.; Tesfaye, M.; Chernet, A.	Current Research in Environmental Sustainability	2021	10.1016/j.crsust.2021.100080	4	This paper is specifically focused on the assessment of the opportunities and challenges of traditional knowledge and institutions for community's sustainable climate change adaptation in Ethiopia.
2	Do climate uncertainties trigger farmers' out-migration in the Lower Mekong Region?	Nguyen, T.P.L.; Sean, C.	Current Research in Environmental Sustainability	2021	10.1016/j.crsust.2021.100087	4	We selected a rural area in Cambodia to examine the link between climate impacts and rural out-migration because the majority of Cambodian territory is located in the Lower Mekong Basin which has experienced long-term climate change.
27	Crop-livestock integration practices, knowledge, and attitudes among smallholder farmers: Hedging against climate change-induced shocks in semi-arid Zimbabwe	Musara, J.P.; Tibugari, H.; Moyo, B.; Mutizira, C.	Open Life Sciences	2021	10.1515/biol-2021-0135	4	A survey with 240 farmers in Insiza district, Matabeleland province, Zimbabwe was conducted. A modified knowledge, attitude, and perception framework was used to analyze data from six wards supported by World Vision through supplementary livelihood programs on crop-livestock integration.
6	Ecosystem-based Adaptation (EbA) strategies for reducing climate change risks and food security of forest-dependent communities in Iran [Strategien zur ökosystembasierten Anpassung (EbA) zur Reduzierung der Risiken des Klimawandels und der Ernährungssicherheit von waldabhängigen Gemeinden im Iran]	Ghanbari, S.; Eastin, I.L.; Khalyani, J.H.; Ghanipour, D.; Ghani, M.C.	Austrian Journal of Forest Science	2021	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85122864487&partnerID=40&md5=c4e3eafc1becaabf1c55a9aa272750f2	4	This study aims to identify strategies that can be applied in practice to improve the economic conditions of local communities and identify ways to decrease poverty within the Arasbaran biosphere reserve of Iran.
2	Variety Traits and Sustainable Food Security: The Role of Improved Cassava Varieties in Kenya	Osewe, M.; Liu, A.; Han, J.	Chemical Engineering Transactions	2021	10.3303/CET2189060	4	This article aims to analyse the role of variety attributes on the adoption and farmers awareness of improved cassava varieties in Kisumu County, Kenya.
6	Cross-cultural variation in thirst perception in hot-humid and hot-arid environments: Evidence from two small-scale populations	Rosinger, A.Y.; Bethancourt, H.J.; Swanson, Z.S.; Lopez, K.; Kenney, W.L.; Huanca, T.; Conde, E.; Nzunza, R.; Ndiema, E.; Braun, D.R.; Pontzer, H.	American Journal of Human Biology	2021	10.1002/ajhb.23715	4	We compared two indicators of perceived thirst (current thirst and pleasantness of drinking water) using visual scales among Tsimane' forager-horticulturalists in the hot-humid Bolivian Amazon and Daasanach agro-pastoralists in hot-arid Northern Kenya.
6	Semantics Analysis of Agricultural Experts' Opinions for Crop Productivity through Machine Learning	Rehman, M.; Razzaq, A.; Baig, I.A.; Jabeen, J.; Tahir, M.H.N.; Ahmed, U.I.; Altaf, A.; Abbas, T.	Applied Artificial Intelligence	2021	10.1080/08839514.2021.2012055	4	It is a descriptive analysis of experts' assessment of the increase in crop productivity through the use of machine learning.
6	Bee representations in human art and culture through the ages	Prendergast, K.S.; Garcia, J.E.; Howard, S.R.; Ren, Z.-X.; McFarlane, S.J.; Dyer, A.G.	Art and Perception	2021	10.1163/22134913-bja10031	4	We take a broad view of human art representations of bees to ask if the current interest in artistic representations of bees is evidenced throughout history, and in different regions of the world prior to globalisation.
6	Renewable energy as a catalyst for equity? Integrating inuit interests with nunavik energy planning	Paquet, A.; Cloutier, G.; Blais, M.	Urban Planning	2021	10.17645/up.v6i4.4453	4	This article explores the potential of RETs through the lens of procedural and substantive equity in the context of Inuit interests and integrated sustainability.
6	Drivers of change and conservation needs for vertebrates in drylands: an assessment from global scale to Sahara-Sahel wetlands	Brito, J.C.; Del Barrio, G.; Stellmes, M.; Pleguezuelos, J.M.; Saarinen, J.	European Zoological Journal	2021	10.1080/24750263.2021.1991496	4	This work tracks the most relevant global change drivers acting on drylands, especially in deserts and arid regions, the conservation actions being developed, and the research needs for vertebrate conservation, following IUCN standardised classification schemes.
6	Synergy between climate risk perception, adaptation responses, and agricultural productivity: the case of rice farming communities in Pakistan	Khan, N.A.; Gong, Z.; Shah, A.A.	Environmental Science and Pollution Research	2021	10.1007/s11356-021-17615-y	2	Article is aimed at rice producers for production. This research was conducted in the rice-growing zone of Punjab province, a region producing over 60% of the country's total rice (Khan et al. 2020b). Punjab is the country's leading agricultural province, contributing over half of the agricultural GDP, constituting half of its cultivated land, and producing over 70% of the country's total cereal crops.
6	Life with big cats: local perceptions of big cat species	Corcoran, W.; Fisher, B.	Animal Conservation	2021	10.1111/acv.12756	4	It is a study on perception about big cats.
6	Impact assessment of weather based agro-advisory services of indus plain farming community under cold arid Ladakh	Kumar, Y.; Raghuvanshi, M.S.; Fatima, K.; Nain, M.S.; Manhas, J.S.; Namgyal, D.; Kanwar, M.S.; Sofi, M.; Singh, M.; Angchuk, S.	Mausam	2021	10.54302/mausam.v72i4.3556	4	The study was conducted to evaluate the impact assessment of adoption of weather prediction using traditional knowledge and IMD based HMAARI Agro Advisory Services to understand the utilization efficiency of natural resources under cold arid region of Ladakh and to identify socio-economic status of agriculture farmers, their source of information, perception of farmers and their knowledge response carried out at High Mountain Arid Agriculture Research Institute, SKUAST (K), Leh-Ladakh. The perception about agromet advisory services.

6	Choice of adaptation strategies to climate change among farm households in mountainous areas of Northeastern Vietnam	Bui, H.T.M.; Do, T.A.	GeoJournal	2021	10.1007/s10708-021-10544-w	4	The paper aims to identify major strategies applied by small-scale farm households to adapt to climate change and determine factors that affect their choice of adaptation strategies.
10	Smallholder coffee producer's perception to climate change and variability: the evidence from Mana district, South-Western Ethiopia	Tesfaye, A.	GeoJournal	2021	10.1007/s10708-021-10537-9	3	The study focused on a perception of coffee producers.
6	Flood hazards and agricultural production risks management practices in flood-prone areas of Punjab, Pakistan	Ahmad, D.; Afzal, M.	Environmental Science and Pollution Research	2021	10.1007/s11356-021-17182-2	6	Location: Punjab.
6	Between uncertainty and hope: Young leaders as agents of change in sustainable small-scale fisheries	Espinoza-Tenorio, A.; Ehuan-Noh, R.G.; Cuevas-Gomez, G.A.; Narchi, N.E.; Ramos-Munoz, D.E.; Melo, F.J.F.R.; Saldivar-Moreno, A.; Zepeda-Dominguez, J.A.; Perez-Jimenez, J.C.; Oliveto-Andrade, A.; Torre, J.	Ambio	2021	10.1007/s13280-021-01639-2	4	To understand young leaders from communities with sustainable small-scale fisheries management practices in Mexico, we used in-depth interviews to identify their shared motivations and perceptions for accepting their fishing heritage.
6	Is migration an effective adaptation to climate-related agricultural distress in sub-Saharan Africa?	Vinke, K.; Rottmann, S.; Gornott, C.; Zabre, P.; Nayna, Schwerdtle, P.; Sauerborn, R.	Population and Environment	2021	10.1007/s11111-021-00393-7	4	In this study, we examine first-time seasonal migration out of a village in North-Western Burkina Faso to neighbouring countries, triggered by more irregular rainfall patterns.
2	Transformational adaptation in agriculture under climate change: A case study in the dry zone of Sri Lanka	Dharmasiri, L.M.; Jayarathne, M.	Indonesian Journal of Geography	2021	10.22146/IJG.64269	9	The present study focused on the impacts of climate change on the settler community who engage in agriculture as their mainstay and respond to the scenario. Twenty samples from a village in the NCP have been selected.
2	Factors Associated with Health-Risk Perception of Heat Waves among Agroecological and Conventional Farmers in the Tropics	How, V.; Singh, S.; Dang, T.; Guo, H.-R.	International Journal of Climate Change: Impacts and Responses	2021	10.18848/1835-7156/CGP/v14i01/45-60	9	Given that Asian countries rely on agriculture for livelihoods, it is necessary to understand the background of both agroecological and conventional farmers' perceptions of extreme temperature effects on health and assess the differences in their risk perceptions. By comparing both farming communities, this study showed that sociodemographic characteristics, agricultural activities, and experiences with heat waves influence farmers' perceptions differently and underscore the likelihood, severity, and worry about the risk of heat waves.
10	Environmental consciousness amongst indigenous youth in Kenya: The role of the sengwer religious tradition	Mamati, K.; Maseno, L.	HTS Teologiese Studies / Theological Studies	2021	10.4102/HTS.V77I2.6690	4	The article focuses on how the Sengwer indigenous community created environmental awareness and utilised their epistemological approaches to ensure a conscious mindset amongst the youth on the sustainability of the environment.
6	Biome Awareness Disparity is BAD for tropical ecosystem conservation and restoration	Silveira, F.A.O.; Ordóñez-Parra, C.A.; Moura, L.C.; Schmidt, I.B.; Andersen, A.N.; Bond, W.; Buisson, E.; Durigan, G.; Fidelis, A.; Oliveira, R.S.; Parr, C.; Rowland, L.; Veldman, J.W.; Pennington, R.T.	Journal of Applied Ecology	2021	10.1111/1365-2664.14060	4	We introduce the concept of Biome Awareness Disparity (BAD)—defined as a failure to appreciate the significance of all biomes in conservation and restoration policy—and quantify disparities in (a) attention and interest, (b) action and (c) knowledge among biomes in tropical restoration science, practice and policy.
6	Smallholder farmers' preference for climate change adaptation for lowland rain-fed rice production in lao pdr	Chun, J.A.; Kim, D.; Lim, Y.; Lee, E.-J.; Lee, H.; Kim, C.-G.; Inthavong, T.; Thammavong, P.	Journal of Agricultural Meteorology	2021	10.2480/agrmet.D-21-00001	4	We attempted to evaluate the adaptation preference of the farmers in Laos through a climate change adaptation survey approach. The eight adaptations including irrigation, nitrogen fertilizer application rates, transplanting date shifting were first assessed by the CERES-Rice model for the two rice cultivars (TDK8 and TDK11).
10	Environmental sustainability assessment of organic vineyard practices from a life cycle perspective	Volanti, M.; Cubillas, Martínez, C.; Cespi, D.; Lopez-Baeza, E.; Vassura, I.; Passarini, F.	International Journal of Environmental Science and Technology	2021	10.1007/s13762-021-03688-2	4	This paper, collecting primary data from three Spanish grape processing factories, quantifies the reduction of the overall impact related to the avoidance of artificial irrigation, amounting to 10%, and the saving of resources (- 4.3 kg oil eq. per ha) due to the replacement of chemical fertilisers with animal manure.
2	Global livestock development: Policies and vision	Khade, S.B.; Khillare, R.S.; Dastagiri, M.B.	Indian Journal of Animal Sciences	2021	https://www.scopus.com/inward/record.uri?eid=2-s2.0-85116548412&partnerID=40&md5=371fdace57ff02497ffb4b3394b17fdd	4	Article is about the transformative changes in the world.
6	Determinants of dairy farmers' likelihood of climate change adaptation in the Thrace Region of Turkey	Koç, G.; Uzmay, A.	Environment, Development and Sustainability	2021	10.1007/s10668-021-01850-x	4	In this context, the purposes of this research are threefold. The first is to demonstrate how dairy farmers in the Thrace region are affected by climate change; the second is to investigate the adaptation methods they use to minimise farm-level negative effects and finally, to analyse the farm and farmer specific factors that determine the likelihood of adaptation.
6	An evaluation of farmers' perception, awareness, and adaptation towards climate change: A study from punjab province pakistan [Uma avaliação da percepção, consciência e adaptação dos agricultores em relação às mudanças climáticas: Um estudo da província de punjab, paquistão]	Tareen, W.U.H.; Kubra, A.T.; Ateeq-Ur-rehman, M.; Mehmood, M.S.; Li, G.; Khan, A.R.; Siddiqui, B.N.	Ciencia Rural	2021	10.1590/0103-8478cr20201109	3	This research discovered the awareness level of climate change, weather conditions, and related factors among Pakistani farmers. Through a stratified random sampling technique, 500 structured questionnaires were distributed among the farmers in four districts of Punjab Pakistan for study analysis.
6	Transformative governance for linking forest and landscape restoration to human well-being in Latin America	Aguiar, S.; Mastrángelo, M.E.; Brancalion, P.H.S.; Meli, P.	Ecosystems and People	2021	10.1080/26395916.2021.1976838	4	Study about Forest and landscape restoration (FLR).

6	Farmers' awareness about impacts of reusing wastewater, risk perception and adaptation to climate change in faisalabad district, pakistan	Sohail, M.T.; Lin, X.; Lizhi, L.; Rizwanullah, M.; Nasrullah, M.; Xiuyuan, Y.; Manzoor, Z.; Elis, R.J.	Polish Journal of Environmental Studies	2021	10.15244/pjoes/134292	6	This study was aimed to determine the farmer's awareness about reusing wastewater in their risk perception and adaptation to climate change in district Faisalabad, Pakistan. Faisalabad has become an industrial hub and industrial discharge is becoming problematic for local community and environment.
6	Climate change in rural Ghana: perceptions and adaptive responses	Addaney, M.; Asibey, M.O.; Cobbinah, P.B.; Akudugu, J.A.	Local Environment	2021	10.1080/13549839.2021.1978411	3	Using the Dormaa West District in Ghana as a case study, data were obtained from 190 household participants across randomly selected five communities; five focus group discussions and interviews with four planning and climate agencies.
6	Green building aspects in Bangladesh: A study based on experts opinion regarding climate change	Chowdhury, M.A.; Sabrina, H.; Zzaman, R.U.; Islam, S.L.U.	Environment, Development and Sustainability	2021	10.1007/s10668-021-01823-0	3	Green building practice may be helpful in reducing the emissions. Focusing on the importance of green building and climate change, this study was conducted in Bangladesh to understand the potentiality of green building practice as an adaptation to climate change.
2	Agroclimatic indices across the Canadian Prairies under a changing climate and their implications for agriculture	Chipanshi, A.; Berry, M.; Zhang, Y.; Qian, B.; Steier, G.	International Journal of Climatology	2021	10.1002/joc.7369	4	With the objective of trying to understand the adaptability of agriculture across the Canadian Prairies under climate change, simple-to-use agroclimatic indices were calculated for the base climate period of 1981 to 2010 and for both the medium (RCP4.5) and high (RCP8.5) emission projections extending to the distant future (2071–2100).
2	Bushfire Risk Detection Using Internet of Things: An Application Scenario	Nosouhi, M.R.; Sood, K.; Kumar, N.; Wevill, T.; Thapa, C.	IEEE Internet of Things Journal	2021	10.1109/JIOT.2021.3110256	4	In this paper, we propose a Machine Learning (ML)–based approach that detects anomalies in spatiotemporal measurements of environmental parameters (e.g., temperature, relative humidity, etc.).
10	Diversity of nematodes on banana (Musa spp.) in Kenya linked to altitude and with a focus on the pathogenicity of Pratylenchus goodeyi	Nyang'Au, D.; Atandi, J.; Cortada, L.; Nchore, S.; Mwangi, M.; Coyne, D.	Nematology	2021	10.1163/15685411-bja10119	4	To assess the understanding and awareness that banana farmers have of nematodes, a survey was conducted.
6	Sectoral energy-CO2 emissions using an environmental input-output framework	Harun, M.; Ahmad, S.A.; Sulaiman, N.; Tria, D.	International Journal of Business and Society	2021	10.33736/ijbs.3782.2021	3	The study is responded to the inadequate of reliable data on Malaysia's sectoral CO2 emissions and to the growing awareness of the effectiveness of Malaysia climate change policies.
10	Understanding climate smart agriculture and the resilience of smallholder farmers in Umguza district, Zimbabwe	Phiri, K.; Nhliziyo, M.; Madzivire, S.I.; Sithole, M.; Nyathi, D.	Cogent Social Sciences	2021	10.1080/23311886.2021.1970425	4	This study documents how smallholder farmers in Umguza District have responded to the adverse effects of climate change by venturing into small grains production, conservation farming and small livestock production. This paper discusses the vulnerability of smallholder farmers in Umguza District to climate change induced risks.
6	Intention of coastal communities to support climate change mitigation policies for fish and marine ecosystem preservation	Galati, A.; Tulone, A.; Vrontis, D.; Thrassou, A.; Crescimanno, M.	Journal of Enterprising Communities	2021	10.1108/JEC-05-2021-0069	4	This paper aims to assess the willingness of individuals living in coastal communities affected by climate change to financially support mitigation policies towards the preservation of marine ecosystems and fish resources and to identify the key drivers of their behaviour.
6	Community perceptions of long-term mangrove cover changes and its drivers from a typhoon-prone province in the Philippines	Quevedo, J.M.D.; Uchiyama, Y.; Kohsaka, R.	Ambio	2021	10.1007/s13280-021-01608-9	4	In this study, MCC and the causal factors are evaluated at the local scale by gathering community perceptions in Eastern Samar, a typhoon-prone province in the Philippines, with a timeframe since the 1970s until the present.
10	Evaluation of climate induced hazards risk for coastal Bangladesh: a participatory approach-based assessment	Faisal, M.; Saha, M.K.; Sattar, M.A.; Biswas, A.K.M.A.A.; Hossain, M.A.	Geomatics, Natural Hazards and Risk	2021	10.1080/19475705.2021.1967203	3	This study identifies the potential climate induced hazards, their vulnerability, capacity, associated risk and explores the potential strategies to reduce the disaster risk. This study was carried out in Uttar Bedkashi Union, Koyra Upazila under Khulna District in south west coastal region of Bangladesh.
6	Expert's opinion on Irish potato farmers awareness and preferences towards climate smart agriculture practices attributes in Kenya	Ogola, R.J.O.; Ouko, K.O.	Cogent Food and Agriculture	2021	10.1080/23311932.2021.1968163	3	A Delphi study was conducted to elicit information on farmers awareness and preference towards CSA practices and their pillar attributes from 22 experts from varied Irish potato and climate research organizations in Kenya.
10	How people perceive resilience of himalayan pheasants, phasianidae, in relation to climate warming in eastern himalaya	Chhetri, B.; Badola, H.K.; Barat, S.	Nature Conservation Research	2021	10.24189/ncr.2021.040	4	Study about the perception of Himalayan pheasants (Ithaginis cruentus, Lophophorus impejanus, Lophura leucomelanos, and Tragopan satyra) with climate change in Eastern Himalaya.
6	Exploring the concept of place in the literature on smallholder farmers and climate change adaptation in Sub-Saharan Africa	Quarshie, P.T.	South African Geographical Journal	2021	10.1080/03736245.2021.1963316	8	This critical review paper expands on the meaning of place. It opens a new narrative on how the geographic concept of place is conceptualized in smallholder farmers and climate change adaptation literature in Sub-Saharan Africa.
2	Climate Justice: a Pacific Island perspective	Enari, D.; Viliamu, Jameson L.	Australian Journal of Human Rights	2021	10.1080/1323238X.2021.1950905	3	This article highlights how the Pacific Island diaspora in Australia are acting in solidarity with their homelands in the fight for climate justice.
6	Educating future landscape professionals about climate change and climate-wise design: current status, priorities, and information needs	Volk, M.; Nettles, B.B.; Hansen, G.	Landscape Research	2021	10.1080/01426397.2021.1958307	6	This paper summarises a survey of faculty and students in post-secondary horticulture and landscape architecture/design programmes within the United States about existing practices of educating students (future professionals) about climate change, as well as perceived priority topics and information needs.
6	Assessing vulnerability of wetland fisheries to climate change: a stakeholders' perception-based approach	Naskar, M.; Sarkar, U.K.; Mishal, P.; Karnatak, G.; Saha, S.; Bandopadhyay, A.; Bakshi, S.; Das Ghosh, B.; Das, B.K.	Climate and Development	2021	10.1080/17565529.2021.1956410	3	This article presents an alternative approach to assess the vulnerability of wetland fisheries to climate change. A total of 15 wetlands from a wetland-fisheries-rich area of West Bengal, India, were selected to illustrate the methodology. The proposed method mainly relies on stakeholders' perceptions of the wetland fisheries vulnerability.
6	Building a framework towards climate-smart agriculture in the Yangambi landscape, Democratic Republic of Congo (DRC)	Mangaza, L.; Sonwa, D.J.; Batsi, G.; Ebuy, J.; Kahindo, J.-M.	International Journal of Climate Change Strategies and Management	2021	10.1108/IJCCSM-08-2020-0084	4	This paper aims to produce a framework for climate-smart agriculture (CSA) in the Yangambi landscape, Democratic Republic of the Congo (DRC). This would enable the authors to identify agricultural practices, assess vulnerability to climate change, identify options for improving agricultural systems from a climate change mitigation and adaptation perspective and finally provide climate-smart agricultural options.
6	Climate change perceptions and adaptations for dairy cattle farmers in jordan: Case study in north east region-al-dhulel area	Ata, M.; Altarawneh, M.; Al-Masad, M.	New Medit	2021	10.30682/nm2102g	3	This study was designed to investigate how dairy farmers of Al-Dhulel Cooperative Dairy Society (ACDS) perceive climate change, the adaptation strategies adopted by farmers to cope with the impact of climate change and the barriers to the adoption of these strategies.

10	Smallholder Farmers' Perceptions, Adaptation Constraints, and Determinants of Adaptive Capacity to Climate Change in Chengdu	Pickson, R.B.; He, G.	SAGE Open	2021	10.1177/21582440211032638	6	Location: Chengdu is the provincial capital city of Sichuan, China.
16	Adaptation of integrated irrigation system to mitigate climate change with respect to gender-sensitive	Dawit, M.; Dinka, M.O.	Agricultural Engineering International: CIGR Journal	2021	ISSN 16821130	4	This study aims at investigating the effects of the adoption of drip irrigation combined with hand-dug wells on crop water productivity and crop yield of smallholder farmers and their perception of the scheme over two cropping seasons at Haramaya districts, Ethiopia.
6	Gender-based variations in the perception of climate change impact, vulnerability and adaptation strategies in the Pra River Basin of Ghana	Bessah, E.; Raji, A.O.; Taiwo, O.J.; Agodzo, S.K.; Ololade, O.O.; Strapasson, A.; Donkor, E.	International Journal of Climate Change Strategies and Management	2021	10.1108/IJCCSM-02-2020-0018	3	The study used semi-structured interviews and questionnaires to collect data from 344 farmers, 64 participants in focus group discussions and 6 agriculture extension officers (key informants) from 10 districts in the Pra River Basin of Ghana.
6	Local adaptive capacity to climate change in mountainous agricultural areas in the eastern Mediterranean (Lebanon)	Mahfoud, C.; Adjizian-Gerard, J.	Climate Risk Management	2021	10.1016/j.crm.2021.100345	3	The assessment was based on a multi-criteria analysis of the key indicators of local adaptive capacity, assisted by a survey conducted on 378 farmers (apple growers) in the study area consisting of 24 villages grouped in 4 clusters.
6	Formulating of small-scale farmers' perception towards climate change in arid areas: Facilitating social interventions for agricultural sustainability	Valizadeh, N.; Karimi, V.; Fooladi Heleileh, B.; Hayati, D.; Bijani, M.	Water and Environment Journal	2021	10.1111/wej.12741	6	This study has been done with the aim of developing and validating a perceptual scale for small-scale farmers in arid regions and also redirecting interventions towards sustainability; it was conducted in the two qualitative and quantitative phases. Study in Bushehr province, Iran.
6	How do farmer's disaster experiences influence their climate change perception and adaptation?	Li, X.; Cao, Z.; Shi, X.	Climate and Development	2021	10.1080/17565529.2021.1949572	3	This paper aims to examine the effects of farmers' disaster experiences on their perception of climate change and adaptive strategies based on a semi-structured survey with 903 farmers in China.
6	How mongolian herders perceive ecological change in a "stable" landscape	Gantuya, B.; Biró, M.; Molnár, Á.; Avar, Á.; Sharifian, Bahraman, A.; Babai, D.; Molnár, Z.	Ecology and Society	2021	10.5751/ES-12454-260221	4	Perception about the landscape and vegetation.
2	Mapping flooded paddy-rice fields in the landscape between Turin and Milan: A GIS-based method for detecting scenic routes for experiential tourism	Scandiffio, A.	GI_Forum	2021	10.1553/GISCIENCE2021_01_S169	4	The current research aims to explore the potential of ESA Sentinel-2 time-series satellite imagery, for detecting the seasonal landscape changes of paddy-rice fields, in the northwest of Italy, by using GIS mapping tools.
6	Adoption Determinants of Adapted Climate Smart Agriculture Technologies among Smallholder Farmers in Machakos, Makueni, and Kitui Counties of Kenya	Muriithi Lydia, N.; Onyari Charles, N.; Mogaka Hezron, R.; Gichimu Bernard, M.; Gatumo Geoffrey, N.; Kizito, K.	Journal of Agricultural Extension	2021	10.4314/jae.v25i2.7	4	The study examined the adoption determinants of adapted climate smart agriculture (CSA) technologies among smallholder farmers.
6	Shade coffee and amphibian conservation, a sustainable way forward? Understanding the perceptions and management strategies of coffee growers in colombia	Roach, N.S.; Acosta, D.; Lacher, T.E.; Jr.	Ecology and Society	2021	10.5751/ES-12449-260233	4	Our goal was to understand (1) the perceptions of cafeteros about biodiversity, and (2) how coffee management practices may impact amphibian conservation in the region.
2	Prospect on agro-industrial residues usage for biobutanol production	Raita, S.; Spalvins, K.; Blumberga, D.	Agronomy Research	2021	10.15159/AR.21.084	4	Article about biobutanol .
10	Synergies and trade-offs of selected climate smart agriculture practices in Irish potato farming, Kenya	Ogola, R.J.O.; Ouko, K.O.	Cogent Food and Agriculture	2021	10.1080/23311932.2021.1948257	4	This study integrated qualitative and quantitative data from 22 expert surveys and semi-structured questionnaires to answer the following objectives: 1) Which top five CSA practices are currently used by Irish potato farmers and which ones are preferred by experts in response to climate change adaptation in Kenya? 2) How do the selected CSA practices perform in Irish potato farming in Kenya? 3) Which synergies and trade-offs occur upon implementation of these CSA practices?
6	Understanding the Local Perception, Adaptation to Climate Change and Resilience Planning Among the Farmers of Semi-Arid Tracks of South India	Dhanya, P.; Ramachandran, A.; Palanivelu, K.	Agricultural Research	2021	10.1007/s40003-021-00560-0	6	Location: Chengalpet district of Tamil Nadu. The present study was conducted in Kancheepuram and Thiruvallur districts (Formerly known as Chengalpet), which are the neighboring districts of Chennai Metropolitan city, in Tamil Nadu state, South India.
2	Assessing socio-economic vulnerability to climate change-induced disasters: evidence from Sundarban Biosphere Reserve, India	Sahana, M.; Rehman, S.; Paul, A.K.; Sajjad, H.	Geology, Ecology, and Landscapes	2021	10.1080/24749508.2019.1700670	4	The study impeccably analyzed the socio-economic vulnerability in SBR using pragmatic approach.
6	Balancing Bees and Livestock: Pastoralist Knowledge, Perceptions and Implications for Pollinator Conservation in Rangelands, Northern Tanzania	Mpondo, F.T.; Ndakidemi, P.A.; Treydte, A.C.	Tropical Conservation Science	2021	10.1177/19400829211028127	4	We assessed local Maasai knowledge on insect pollinators and how pollinators affect livelihood diversification in Simanjiro rangelands, Tanzania.
6	Perceived impacts of climate variability and change: an exploration of farmers' adaptation strategies in Zimbabwe's intensive farming region	Mavhura, E.; Manyangadze, T.; Aryal, K.R.	GeoJournal	2021	10.1007/s10708-021-10451-0	3	This study therefore, examined the perceptions of commercial farmers.
6	Gender mainstreaming in risk reduction and resilience-building strategies: local conceptualisation of gender and masculinities in Malawi and Zambia	Khoza, S.	Disaster Prevention and Management: An International Journal	2021	10.1108/DPM-03-2021-0066	4	This paper aims to explore the local conceptualisation of gender and framings of men and masculinities at the local level, which may be applied to improve gender mainstreaming in smallholder farming.
2	From Glass Ceiling to Green Canopy: An Intersectional Model of Feminist Sustainability in Fondes Amandes, Trinidad	Mulroy, R.	Journal of International Women's Studies	2021		4	Study abour Permaculture .

6	Environmental art education binding with natural experiences – impacts on students' environment awareness	Ding, L.	Journal of Environmental Protection and Ecology	2021		3	As for the experimental subjects, 312 primary school students in Jiangxi Province participated in the research.
6	Climate change, tourism, and community development: perceptions of Maun residents, Botswana	Hambira, W.L.; Saarinen, J.; Atlhopheng, J.R.; Mamva, H.	Tourism Review International	2021	10.3727/154427220X16059054538773	3	The purpose of this article is to examine community perceptions with regards to the tourism-climate change nexus in Maun, a key tourism hub in Botswana and dependent on the tourism economy.
6	The development, implementation and challenges to water-saving practices in a water-stressed destination: a case study of the Songkran Festival, Thailand	Intason, M.; Coetzee, W.; Lee, C.	International Journal of Event and Festival Management	2021	10.1108/IJEFM-10-2020-0065	4	This study aims to investigate the opportunities and challenges to responsible practices of water-saving at a cultural festival, using a case study of the water-splashing practice at the Songkran Festival in Thailand.
6	Vulnerability of wild indigenous agroforestry species to climate change in Niger State, Nigeria: A proxy analysis	Allakonon, M.G.B.; Guidigan, M.L.G.; Belarmain, A.F.	Environment, Development and Sustainability	2021	10.1007/s10668-021-01577-9	4	This study assessed the vulnerability of five indigenous agroforestry trees to climate change: Adansonia. digitata, Vitellaria paradoxa, Parkia biglobosa, Tamarindus indica, and Vitex doniana, using the vulnerability of rural communities that rely on these species as a proxy.
10	Lessons from local indigenous climate adaptation practices: perceptions and evidence from coastal Bangladesh	Amin, M.N.; Asaduzzaman, M.; Kabir, A.; Snigdha, S.S.; Hossain, M.S.	Local Environment	2021	10.1080/13549839.2021.1937970	4	Lessons of local-scale climate change adaptations through indigenous techniques and knowledge practices (ITKPs) are imperative for climate adaptation policies. This study focused on the benefits of ITKPs and the potential of integrating them into climate adaptation and development activities through focus group discussions (FGDs) (n = 4) (involving persons over 18 years old, had recent disaster experience, and had lived at least 12 years in the area) and household surveys (n = 130) in the southern coastal areas of Bangladesh.
6	Grain for Green Project in farmers' minds: perceptions, aspirations and behaviours in eco-fragile region, Xinjiang, China	Duan, P.; Chen, S.; Zhang, H.; Zhang, F.	International Journal of Climate Change Strategies and Management	2021	10.1108/IJCCSM-06-2020-0069	4	This study aims to focus on the analysis of the internal mechanism of farmers' ecological cognition and the behaviour of Grain for Green Project (GGP), and the further relationship between ecological cognition and ecological aspiration, proposing climate change strategies and management from the perspective of farmers.
10	Creating value: sustainability and accounting for non-financial matters in the pre- and post-corona environment	Lodhia, S.; Sharma, U.; Low, M.	Meditari Accountancy Research	2021	10.1108/MEDAR-03-2021-1249	4	This paper aims to introduce the special issue on "sustainability and accounting for non-financial matters: qualitative and quantitative research approaches". This special issue was organised at the time when the entire globe was affected by the Coronavirus and accordingly, this paper has taken this opportunity to discuss the implications of this pandemic on accounting for non-financial issues, especially in relation to sustainability accounting research and practice.
6	Uncertainty in the ''new normal'': Understanding the role of climate change beliefs and risk perceptions in michigan tree fruit growers' adaptation behaviors	Linder, J.; Campbell-Arvai, V.	Weather, Climate, and Society	2021	10.1175/WCAS-D-20-0058.1	3	For this study, 16 semistructured interviews were conducted with Michigan tree fruit growers to understand how their climate change beliefs, beliefs about adaptive actions, and climate-related risk perceptions influence adaptation behaviors.
2	Variations in climate change adaptation among households of different ethnicities in mountainous areas of Vietnam	Bui, T.M.H.	Kasetsart Journal of Social Sciences	2021	10.34044/j.kjss.2021.42.2.18	3	This study assesses differences in climate change adaptation among households of different ethnicities in two mountainous provinces in Northeast Vietnam.
6	Trusted land: land deals, climate vulnerability and adaptation in Northern Mozambique	Gomes, C.	Climate and Development	2021	10.1080/17565529.2020.1852909	4	This paper analyses the effects of resettlement on the vulnerability of relocated rural communities in Mozambique, from the perspective of environmental justice.
6	Non-formal education promotes innovation and climate change preparedness among isolated Nepalese farmers	Coppock, D.L.; Pandey, N.; Tulachan, S.; Duwal, D.; Dhungana, M.; Dulal, B.P.; Davis, D.	Climate and Development	2021	10.1080/17565529.2021.1921685	4	Our research objective was to identify, implement, and assess a suite of interventions promoting climate change preparedness and poverty reduction for two traditional farming communities in Bajura District.
6	Perception of the impacts of climate and environmental variability on water availability, irrigation and farming systems: a study in rural households of Awash River Basin, Ethiopia	Tadese, M.T.; Kumar, L.; Koech, R.; Kogo, B.K.	International Journal of Agricultural Sustainability	2021	10.1080/14735903.2021.1930738	3	The abstract doesn't mention if the farmers are smallholders.
6	What will drive the small tea growers towards environment-friendly cultivation? Implications from the tea sector in Assam, India	Deka, N.; Goswami, K.; Anurupam, K.	Climate and Development	2021	10.1080/17565529.2021.1930988	4	This study draws lessons from the adoption of organic cultivation by some of the STGs in Assam, India.
6	Factors influencing the simultaneous adoption of risk management instruments in Mediterranean irrigated agriculture	Sánchez-Cañizares, S.M.; Dolores Guerrero-Baena, M.; Gómez-Limón, J.A.	Journal of Environmental Planning and Management	2021	10.1080/09640568.2021.1922364	4	The objective of this article is to analyze the explanatory variables for the simultaneous adoption of a large set of risk management instruments.
6	Factors affecting farmers' willingness to adopt crop insurance to manage disaster risk: evidence from Bangladesh	Islam, M.D.I.; Rahman, A.; Sarker, M.S.R.; Luo, J.; Liang, H.	International Food and Agribusiness Management Review	2021	10.22434/IFAMR2019.0190	4	This study aims to fill that research gap by exploring the factors influencing agricultural producers to purchase crop insurance.
6	Attitude changes of stakeholders towards climate change adaptation policies in agricultural sector by online deliberation	Baba, K.; Amanuma, E.; Kosugi, M.	Climate	2021	10.3390/cli9050075	3	This study set up online virtual communities consisting of farmers and stakeholders involved in agriculture and nonfarmers living in rural areas interested in agricultural production.
6	Understanding vietnamese farmers' perception toward forest importance and perceived willingness-to-participate in redd+ program: A case study in nghe an province	Van Khuc, Q.; Pham, L.; Tran, M.; Nguyen, T.; Tran, B.Q.; Hoang, T.; Ngo, T.; Tran, T.-D.	Forests	2021	10.3390/f12050521	4	This study uses a random sample approach coupled with a face-to-face interview method to survey 215 households in Chau Thai, one of 206 poor communes in Nghe An province, to learn about (1) residents' perception towards the importance of forests, (2) how forests contribute as a source of livelihood, (3) potential for household engagement in REDD+.
2	Determinants of climate variability adaptation and mitigation strategies harnessed by smallholder maize farmers in Sebayeng village, Limpopo Province, South Africa	Mangwane, Q.; Oluwatayo, I.B.	Food Research	2021	10.26656/fr.2017.5(2).344	6	This study, therefore, examined factors influencing the choice of climate variability adaptation and mitigation strategies employed among smallholder maize farmers in Sebayeng village, Limpopo province, South Africa.

6	Application of weather forecasts in farm management decisions: The case of Iran	Parsi, L.; Maleksaeidi, H.	Journal of Agricultural Science and Technology	2021	20.1001.1.16807073.2021.23.3.5.2	3	Weather forecasts have potential for improving adaptation and resilience of agricultural systems to climate changes; however, there is still uncertainty on the factors affecting the use of this information in farm management decisions. This survey study was conducted on the application of weather information by 213 farmers selected through a stratified random sampling technique in 21 rural areas of Veys, in Khuzestan Province.
6	Farmers' Perception about the Use of Sorghum (Sorghum bicolor (L.) Moench) Landraces and Their Genetic Erosion in South Wollo Administrative Zone, Ethiopia	Birhanu Abegaz, S.; Hailu Tessema, F.	International Journal of Agronomy	2021	10.1155/2021/3601897	4	Thus, this study is aimed to assess farmers' perception about the use of sorghum landraces and their genetic erosion and to identify suggested reasons for the replacement of sorghum landraces.
6	To what extent do weather and climate information services drive the adoption of climate-smart agriculture practices in Ghana?	Djido, A.; Zougmoré, R.B.; Houessionon, P.; Ouédraogo, M.; Ouédraogo, I.; Seynabou Diouf, N.	Climate Risk Management	2021	10.1016/j.crm.2021.100309	4	This study examines this nexus by focusing on mobile phone delivery channels of weather forecasts through the ESOKO platform in the Upper West Region of Ghana.
6	Farmers' perception regarding climate change in southern turkey: The case of the Mersin province	Hayran, S.; Duru, S.; Kapur, B.; Gul, A.; Turgut, Y.S.	New Medit	2021	10.30682/NM2101E	3	This study aims to determine whether climate change is a phenomenon via the analysis of the perceptions of the farmers regarding this issue in the Mersin province conducted through 251 questionnaires. The abstract does not mention if they are dealing with smallholders.
6	Farmers' and herders' perceptions on rangeland management in two agroecological zones of Benin	Diogo, R.V.C.; Dossa, L.H.; Vanvanhossou, S.F.U.; Abdoulaye, B.D.; Dosseh, K.H.; Houinato, M.; Schlecht, E.; Buerkert, A.	Land	2021	10.3390/land10040425	4	The present study aims to (i) assess the perception of farmers and herders of the risks and opportunities of transhumance on rangeland resource use and management, and to (ii) generate useful knowledge for the design and implementation of policies that favor the coexistence of these actors and reduce competition over rangeland resources use in Benin.
6	Assessing land use and land cover change and farmers' perceptions of deforestation and land degradation in south-west Côte d'Ivoire,West Africa	Kouassi, J.-L.; Gyau, A.; Diby, L.; Bene, Y.; Kouamé, C.	Land	2021	10.3390/land10040429	4	This study assessed land use and land cover (LULC) change and farmers' perceptions of the drivers and effects of deforestation and land degradation in south-western Côte d'Ivoire.
6	A case study of fly ash utilization for enhancement of growth and yield of cowpea (Vigna unguiculata L.) to sustainable agriculture	Kumar, K.; Kumar, A.	Biomass Conversion and Biorefinery	2021	10.1007/s13399-021-01459-0	4	The main purpose of this work was to use the pollutant as fertilizer.
2	What is recycled water, anyway? Investigating greenhouse grower definitions, perceptions, and willingness to use recycled water	McOmber, C.; Zhuang, Y.; Raudales, R.E.; Vadas, T.M.; Kirchhoff, C.J.	Renewable Agriculture and Food Systems	2021	10.1017/S1742170521000090	4	We question this assumption and explore whether the ways in which growers conceptualize recycled water is associated with the ways they perceive its usability.
6	Application of innovative space technology approaches to the sustainability of agricultural systems in the developing world	Lamba, S.; Rani, S.; Kumar, N.	Remote Sensing Letters	2021	10.1080/2150704X.2021.1890264	3	This manuscript inculcates some of those crucial applications that can be adopted in the developing world's agricultural production systems.
6	Towards smart green wall maintenance and Wallbot technology	Wilkinson, S.; Carmichael, M.; Khonasty, R.	Property Management	2021	10.1108/PM-09-2020-0062	4	The aim was to gain a deeper understanding of the issues affecting maintenance of green walls on different building types in New South Wales Australia to inform the design of a prototype robot to maintain green walls.
6	Eyes on the Horizon: Temporal and Social Perspectives of Climate Risk and Agricultural Decision Making among Climate-Informed Farmers	Schattman, R.E.; Caswell, M.; Faulkner, J.W.	Society and Natural Resources	2021	10.1080/08941920.2021.1894283	3	Through analysis of semi-structured interviews with farmers in the northeastern United States, we conclude that temporal distance (now versus later) and social distance (self versus other) of climate impacts interact to play important roles in climate risk perception.
6	Social Media Used by Arable Crop Farmers for Communicating Climate Change Adaptation Strategies in Imo State, Nigeria https://dx.doi.org/10.4314/jae.v25i1.8	Abuta, C.M.-A.; Agumagu, A.C.; Adesope, O.M.	Journal of Agricultural Extension	2021	10.4314/jae.v25i1.8	4	The study examined social media use by arable crop farmers for climate change adaptation communication in Imo State, Nigeria.
6	Do socio economic characteristics of farming community really matter for the adoption of climate change strategies? A case study of Central Punjab, Pakistan	Shahbaz, P.; Boz, I.; ul Haq, S.;	Fresenius Environmental Bulletin	2021		3	Location: Punjab.
6	Climate change risk perceptions, facilitating conditions and health risk management intentions: Evidence from farmers in rural China	Li, W.; Yuan, K.; Yue, M.; Zhang, L.; Huang, F.	Climate Risk Management	2021	10.1016/j.crm.2021.100283	3	Using a sample of 1499 rice farmers in China
6	Farmers' perceptions and role of institutional arrangements in climate change adaptation: Insights from rainfed Pakistan	Mahmood, N.; Arshad, M.; Mehmood, Y.; Faisal, Shahzad M.; Kächele, H.	Climate Risk Management	2021	10.1016/j.crm.2021.100288	3	Using farm household-level data of 400 rainfed farmers collected through a well-designed and field-tested questionnaire, this study examines the association between various adaptation stages (climate risk perceptions, adaptation planning, and implementation of adaptation) and their determinants using a multivariate probit (MVP) model.
6	Vision Mātauranga research directions: opportunities for iwi and hap? management plans	Kaiser, L.H.; Saunders, W.S.A.	Kotuitui	2021	10.1080/1177083X.2021.1884099	4	The purpose of this paper is to raise awareness of the value of these plans for researchers, particularly when developing a research project; and to provide a starting point for engagement opportunities and activities with Māori.
6	Energy Efficiency Enhancement and Climate Change Mitigations of SMEs through Grid-Interactive Solar Photovoltaic System	Lalith Pankaj, Raj G.N.; Kirubakaran, V.	International Journal of Photoenergy	2021	10.1155/2021/6651717	3	This paper discusses the complete electrical energy audit on a small-scale Siddha and Ayurveda medicine industry.
6	Awareness of climate change's impacts and motivation to adapt are not enough to drive action: A look of Puerto Rican farmers after Hurricane Maria	Rodríguez-Cruz, L.A.; Niles, M.T.	PLoS ONE	2021	10.1371/journal.pone.0244512	6	Data of surveyed farmers throughout Puerto Rico after Hurricane Maria.

2	Path dependencies in Norwegian dairy and beef farming communities: Implications for climate mitigation	Rønningen, K.; Magnus Fuglestad, E.; Burton, R.	Norsk Geografisk Tidsskrift	2021	10.1080/00291951.2020.1865443	4	The article examines the path dependency of the dairy and beef production system in Norway and focuses on identifying lock-ins.
6	On- and non-farm adaptation in Senegal: understanding differentiation and drivers of farmer strategies	Voss, R.C.	Climate and Development	2021	10.1080/17565529.2021.1881424	4	This study examines farmers' perceptions of environmental change and socioeconomic transition in Senegal and the drivers and constraints on their adaptive responses, with particular attention to the interplay of on- and non-farm livelihood strategies amid concerns about changing weather.
6	Synergies and trade-offs for climate-resilient agriculture in India: an agro-climatic zone assessment	Singh, N.P.; Anand, B.; Singh, S.; Srivastava, S.K.; Rao, C.S.; Rao, K.V.; Bal, S.K.	Climatic Change	2021	10.1007/s10584-021-02969-6	4	In this paper, we present an analysis and discussion of multi-scalar and multi-indicator assessment, by profiling resilience across agro-climatic zones of India, based on the development of a Climate-Resilient Agriculture Index embracing environmental, technological, socio-economic, and institutional and infrastructural dimension.
26	Understanding the vulnerability, farming strategies and development pathways of smallholder farming systems in Telangana, India	Kuchimanchi, B.R.; van Paassen, A.; Oosting, S.J.	Climate Risk Management	2021	10.1016/j.crm.2021.100275	4	The current study examines the vulnerability of three smallholder farming systems, namely, (i) crop without livestock (CWL), (ii) crop with small ruminants (CSR), and (iii) crop with dairy (CD), in the context of climate change in Telangana, India.
6	Empirical evidence from Bangladesh of assessing climate hazard-related loss and damage and state of adaptive capacity to address them	Bhowmik, J.; Irfanullah, H.M.; Selim, S.A.	Climate Risk Management	2021	10.1016/j.crm.2021.100273	3	Based on 14 focused group discussions, 20 in-depth interviews, and eight key informant interviews, this study sought to understand the losses and damages experienced by rural communities in three locations of Bangladesh, which are vulnerable to riverine and flash floods or cyclones, associated surges & coastal flooding, and salinity intrusion.
6	Classifying climate change perceptions of bean breeders in Santander-Colombia	Botero, H.; Barnes, A.; Perez, L.; Rios, D.; Ramirez-Villegas, J.	Climate and Development	2021	10.1080/17565529.2020.1848782	3	A latent class analysis (LCA) is applied to a survey designed to capture the climate change perceptions of 566 bean farmers in the Colombian department of Santander.
6	Climate change adaptation planning in remote contexts: insights from community-based natural resource management and rural development initiatives in the Pacific Islands	Medina Hidalgo, D.; Nunn, P.D.; Beazley, H.; Sovinasalevu, J.S.; Veitayaki, J.	Climate and Development	2021	10.1080/17565529.2020.1867046	4	This study used thematic analysis to identify key insights from a 20-year old community-based resource management and development initiative on a remote island in Fiji.
2	Nonstationary stochastic simulation method for the risk assessment of water allocation	Chen, S.; Xu, J.; Li, Q.; Wang, Y.; Yuan, Z.; Wang, D.	Environmental Science: Water Research and Technology	2021	10.1039/d0ew00695e	4	To analyze the risk of water allocation schemes under nonstationary conditions, a nonstationary stochastic simulation-based risk assessment method is proposed.
6	Scepticism and perceived self-efficacy influence fishers' low risk perceptions of climate change	Maltby, K.M.; Simpson, S.D.; Turner, R.A.	Climate Risk Management	2021	10.1016/j.crm.2020.100267	6	Location: south-west UK
10	Climate change, pesticides and health: Considering the risks and opportunities of adaptation for zimbabwean smallholder cotton growers	Zinyemba, C.; Archer, E.; Rother, H.-A.	International Journal of Environmental Research and Public Health	2021	10.3390/ijerph18010121	2	Cotton farmers.
2	Impact of agrochemical emission models on the environmental assessment of paddy rice production using life cycle assessment approach	Rezaei, M.; Soheilifard, F.; Keshvari, A.	Energy Sources, Part A: Recovery, Utilization and Environmental Effects	2021	10.1080/15567036.2020.1864066	4	This study aimed to investigate the impact of agrochemical emission models on the environmental impacts of paddy rice production in paddy fields in three major regions in the north of Iran.
6	Rural climate resilience through built-environment interventions: modified deliberation with analysis as a tool to address barriers to adaptive capacity	Arnold, J.L.; Cangelosi, E.; Beyea, W.R.; Shaaban, A.; Kim, S.-K.	Regional Studies, Regional Science	2021	10.1080/21681376.2020.1854110	3	This paper addresses this gap in understanding through a pilot project that developed a climate and health-adaptation plan with Marquette County, a geographically large, coastal, non-agricultural-based, rural community in Michigan's Upper Peninsula.
6	Assessing the impacts of land use and climate interactions on beekeeping livelihoods in the Taita Hills, Kenya	Newman, R.J.S.; Marchant, R.; Enns, C.; Capitani, C.	Development in Practice	2021	10.1080/09614524.2020.1854689	4	This article investigates beekeepers' experiences and perceptions about challenges to beekeeping in the Taita Hills Mountains, Kenya.
6	Smallholder farmers' perception of Sustainable Land Management Practices (SLMPs) in the Upper West Region, Ghana	Sungbaahee, S.B.; Kpieta, A.B.	African Geographical Review	2021	10.1080/19376812.2020.1845216	4	In this paper, we used quantitative methods to explore smallholder farmers' (256) perceptions and adoption of three sustainable land management practices–animal manure, compost, and minimum tillage in two Districts in semiarid Northern Ghana. Our findings show positive perception index scores for animal manure, compost, and minimum tillage, respectively.
6	Farmers' perceptions of climate change and adaptation strategies in South Africa's Western Cape	Talanow, K.; Topp, E.N.; Loos, J.; Martín-López, B.	Journal of Rural Studies	2021	10.1016/j.jrurstud.2020.10.026	3	We conducted semi-structured interviews to examine climate change adaptation behaviour by commercial grain and wine grape farmers in a water-scarce, recently drought-stricken agricultural region of South Africa's Western Cape.
6	Hot fish: The response to climate change by regional fisheries bodies	Sumby, J.; Haward, M.; Fulton, E.A.; Pecl, G.T.	Marine Policy	2021	10.1016/j.marpol.2020.104284	3	This paper explores institutional responses from Regional Fisheries Bodies (RFBs) to climate change.
27	"What are you going to do, Protest the Wind?": Community Perceptions of Emergent and Worsening Coastal Erosion from the Remote Bering Sea Community of St. Paul, Alaska	Tran, J.; Divine, L.M.; Heffner, L.R.	Environmental Management	2021	10.1007/s00267-020-01382-6	4	This study aimed to inform St. Paul's erosion monitoring and climate adaptation strategies by documenting community perceptions of coastal erosion as an ecological and social threat within a broader context of multiple established climate stressors.
2	Projection of reference crop evapotranspiration under future climate change in poyang lake watershed, china	Liu, Z.; Lu, J.; Huang, J.; Chen, X.; Zhang, L.	Journal of Hydrologic Engineering	2021	10.1061/(ASCE)HE.1943-5584.0002020	4	Based on the meteorological data and the output of the general circulation model (GCM) from the Coupled Model Intercomparison Project Phase 5 (CMIP5), we used the Penman-Monteith formula and downscaling model to calculate the history and future ET0 in Poyang Lake watershed, respectively.
6	The Subjective Climate Migrant: Climate Perceptions, Their Determinants, and Relationship to Migration in Cambodia	Parsons, L.; Nielsen, J.Ø.	Annals of the American Association of Geographers	2021	10.1080/24694452.2020.1807899	6	Drawing on a 691-case survey of climate perceptions in Cambodia, it explores three dimensions of climate change perception.

6	Elaborating a people-centered approach to understanding sustainable livelihoods under climate and environmental change: Thang Binh District, Quang Nam Province, Vietnam	Mabon, L.; Nguyen, S.T.; Pham, T.T.; Tran, T.T.; Le, H.N.; Doan, T.T.H.; Hoang, T.N.H.; Mueller-Hirth, N.; Vertigans, S.	Sustainability Science	2021	10.1007/s11625-020-00861-3	4	This paper explores the maintenance of livelihoods under climate, environmental, and economic development pressures, through the case of Thang Binh District in Quang Nam Province, Vietnam.
6	Agricultural Producers' Views of Climate Change in the Canadian Prairies: Implications for Adaptation and Environmental Practices	Fletcher, A.J.; Hurlbert, M.; Hage, S.; Sauchyn, D.	Society and Natural Resources	2021	10.1080/08941920.2020.1823541	3	Farmers and ranchers in the Canadian Prairies.
6	Assessing rural households' resilience and adaptation strategies to climate variability and change	Keshavarz, M.; Moqadas, R.S.	Journal of Arid Environments	2021	10.1016/j.jaridenv.2020.104323	4	Therefore, a survey research was conducted in northeast Iran to serve as a case study in a developing country. A multistage stratified random sampling technique was used to investigate the climate resilience of 224 farm families.
6	Sustainability of rice-based livelihoods in the upper floodplains of Vietnamese Mekong Delta: Prospects and challenges	Tran, D.D.; Huu, L.H.; Hoang, L.P.; Pham, T.D.; Nguyen, A.H.	Agricultural Water Management	2021	10.1016/j.agwat.2020.106495	2	Our study examines rice farmers' livelihood sustainability in the upper delta by applying a sustainable livelihood framework to systematically identify prospects and challenges for more sustainable flood-based livelihoods.
6	Evaluation of the impact of climate change on the characteristics of drought in Sahel Region of Nigeria: 1971–2060	Ogunrinde, A.T.; Oguntunde, P.G.; Akinwumiju, A.S.; Fasinmirin, J.T.	African Geographical Review	2021	10.1080/19376812.2020.1814826	4	The impact of climate change on the agricultural and water resources sectors cannot be overemphasized since West Africa is prone to drought as a result of high variability in rainfall and temperature. In this study, an assessment on the impact of climate change in the Sahel Region of Nigeria (SRN) on drought was carried out between 1971 and 2060.
2	Can reduced tillage buffer the future climate warming effects on maize yield in different soil types of West Africa?	Nafi, E.; Webber, H.; Danso, I.; Naab, J.B.; Frei, M.; Gaiser, T.	Soil and Tillage Research	2021	10.1016/j.still.2020.104767	4	The overarching aim of our study was to (i) calibrate and evaluation the DSSAT model for maize and parameterize the DSSAT tillage module for different tillage practices (contour ridge tillage and reduced tillage), and (ii) simulate the effects of different management options (tillage and crop residue incorporation) to buffer future extreme climate events on maize yield in four soil types (Lixisols and Plinthosols) located in two landscape positions (upslope and footslopes) of Benin and Burkina-Faso in West Africa, using two climate scenarios (baseline and 2 °C above pre-industrial period).
6	Animal Agriculture and Climate Change in the US and UK Elite Media: Volume, Responsibilities, Causes and Solutions	Kristiansen, S.; Painter, J.; Shea, M.	Environmental Communication	2021	10.1080/17524032.2020.1805344	4	This study analyzes how much attention the UK and US elite media paid to animal agriculture's role in climate change, and the roles and responsibilities of various parties in addressing the problem, from 2006 to 2018.
6	Environmental awareness- using non-formal education to impart skills and knowledge to improve crop yield: the case of manyeledi community, South Africa	Teane, F.M.	International Research in Geographical and Environmental Education	2021	10.1080/10382046.2020.1788777	4	This article sheds light on how non-formal education was used as a tool to provide knowledge and skills for Manyeledi community members who are engaged in subsistence farming, to improve their crop yield.
2	Climate change impacts on agriculture's southern frontier – Perspectives for farming in North Patagonia	del Barrio, R.; Fernandez, E.; Brendel, A.S.; Whitney, C.; Campoy, J.A.; Luedeling, E.	International Journal of Climatology	2021	10.1002/joc.6649	4	Using historic records from 11 weather stations from North Patagonia, we evaluate the possible impacts of climate change on fruit tree cultivation.
6	Scenarios development with Alaska's Arctic Indigenous youth: perceptions of healthy sustainable futures in the Northwest Arctic Borough	Cost, D.; Lovecraft, A.L.	Polar Geography	2021	10.1080/1088937X.2020.1755906	3	Study with high school students' in Artic.
6	Enhancing adaptive capacity to manage climate risk in agriculture through community-led climate information centres	Nidumolu, U.; Adusumilli, R.; Tallapragada, C.; Roth, C.; Hochman, Z.; Sreenivas, G.; Raji Reddy, D.; Ratna Reddy, V.	Climate and Development	2021	10.1080/17565529.2020.1746230	3	This research catalysed the development of the CLimate Information Centre concept (CLIC), further evolving into the development of an ICT platform of software and hardware that integrated the ACCA project results, biweekly agro-meteorological advisory bulletins and static agronomy information.
6	A comparative analysis of gender and youth issues in rice production in North, Central, and South Vietnam	Nhat Lam Duyen, T.; Rañola, R.F.; Sander, B.O.; Wassmann, R.; Tien, N.D.; Ngoc, N.N.K.	Climate and Development	2021	10.1080/17565529.2020.1734771	2	This paper examines how rice farmers at all gender and ages perceive climate change and adopt Climate Smart Agriculture (CSA) technologies to enhance resilience and adaptation in three sub-regions of Vietnam.
6	Fishers' perceptions and adaptation on climate change in northeastern Taiwan	Chen, J.-L.	Environment, Development and Sustainability	2021	10.1007/s10668-020-00598-0	6	This study selected Keelung City, New Taipei City, and Yilan County as case studies for analyzing fishers' perceptions on climate change in northeastern Taiwan.
1	Livestock feed resources in the West African Sahel	Amole, T.; Augustine, A.; Balehegn, M.; Adesogoan, A.T.	Agronomy Journal	2021	10.1002/agj2.20955	4	The objective of this study was to review the available feed resources and their quality in West African Sahel across different agro-ecological zones and to identify the research gaps and strategies to improve feed resource availability.
1	Strategies to Improve Management of Indonesia's Blue Carbon Seagrass Habitats in Marine Protected Areas	Rifai, H.; Hernawan, U.E.; Zulpikar, F.; Sondakh, C.F.A.; Ambo-Rappe, R.; Sjafrie, N.D.M.; Irawan, A.; Dewanto, H.Y.; Rahayu, Y.P.; Reenyan, J.; Safaat, M.; Alifatri, L.; Rahmawati, S; Hakim, A; Rusandi, A.; Wawo, M.	Coastal Management	2021	10.1080/08920753.2022.2022948	3	Involves multiple stakeholders in participatory decision-making to promote the protection of marine areas in Indonesia due to blue carbon seagrass habitats.
1	Anthropogenic land-use change shapes bird diversity along the eastern Himalayan altitudinal gradient	Penjor, U.; Jamtsho, R.; Sherub, S.	Journal of Applied Ecology	2021	10.1111/1365-2664.14101	4	Using data from replicated transect surveys, we investigated the effects of land-use change (agriculture, settlement and forest) on the community diversity and structure of 336 bird species while accounting for imperfect detection across 679-point count locations along an elevational gradient in the eastern Himalayan biodiversity hotspot of Bhutan.
1	Ovalbumin production using Trichoderma reesei culture and low-carbon energy could mitigate the environmental impacts of chicken-egg-derived ovalbumin	Jarvio, N.; Parviainen, T.; Maljanen, N.L.; Kobayashi, Y.; Kujanpaa, L.; Ercili-Cura, D.; Landowski, C.P.; Ryynanen, T.; Nordlund, E.; Tuomisto, H.L.	Nature food	2021	10.1038/s43016-021-00418-2	4	It is a study on a fungus used by the food industry.
1	Tree species flammability based on plant traits: A synthesis	Popovic, Z.; Bojovic, S.; Markovic, M.; Cerda, A.	Science of the Total Environment	2021	10.1016/j.scitotenv.2021.149625	4	This review summarizes the current state of knowledge regarding the impact of individual plant traits of tree species on flammability components.
1	Villagers' Perception and Attitude Toward Wetland Values and Conservation in Vietnam: A Case Study of Xuan Thuy Ramsar National Park	Truong, D.D.	Frontiers in Sociology	2021	10.3389/fsoc.2021.763743	4	This study examined the attitudes of local communities towards the values and management of Xuan Thuy National Park (XTNP) in Vietnam. The study also explores factors affecting conservation attitudes in the study area. A survey was implemented to 677 households randomly selected in five communes adjacent to XTNP.

1	Evaluating the Application of the Mental Model Mapping Tool (M-Tool)	van den Broek, K.L.; Luomba, J.; van den Broek, J.; Fischer, H.	Frontiers in Psychology	2021	10.3389/fpsyg.2021.761882	4	Assessment of the impact of using models for discussion and control communities on environmental conservation in Tanzania.
1	Barriers to mainstream adoption of catchment-wide natural flood management: a transdisciplinary problem-framing study of delivery practice	Wingfield, T.; Macdonald, N.; Peters, K.; Spees, J.	Hydrology and Earth System Sciences	2021	10.5194/hess-25-6239-2021	4	Study about the Natural flood management (NFM) in the UK.
1	Drought risk for agricultural systems in South Africa: Drivers, spatial patterns, and implications for drought risk management	Meza, I.; Rezaei, E.E.; Siebert, S.; Ghazaryan, G.; Nouri, H.; Dubovyk, O.; Gerdener, H.; Herbert, C.; Kusche, J.; Popat, E.; Rhyner, J.; Jordaan, A.; Walz, Y.; Hagenlocher, M.	Science of the Total Environment	2021	10.1016/j.scitotenv.2021.149505	4	This paper presents, for the first time, a national drought risk assessment for irrigated and rainfed systems, that takes into account the complex interaction between different risk components. We use modeling and remote sensing approaches and involve national experts in selecting vulnerability indicators and providing information on human and natural drivers.
1	Climate change, marine resources and a small Chilean community: making the connections	van Leeuwen, S.M.; Salgado, H.; Bailey, J.L.; Beecham, J.; Iriarte, J.L.; Garcia-Garcia, L.; Thorpe, R.	Marine Ecology Progress Series	2021	10.3354/meps13934	4	We applied the GOTM-ERSEM-BFM coupled hydro-biogeochemical water-column model to gauge lower-trophic level marine ecological community response to bottom-up stressors (climate change, ocean acidification), coupled to an existing Ecopath with Ecosim model for the area, which included top-down stressors (fishing).
1	Forage conservation in sub-Saharan Africa: Review of experiences, challenges, and opportunities	Balehegn, M.; Ayantunde, A.; Amole, T.; Njarui, D.; Nkosi, B.D.; Muller, F.L.; Meeske, R.; Tjelele, T.J.; Malebana, I.M.; Madibela, O.R.; Boitumelo, W.S.; Lukuyu, B.; Weseh, A.; Minani, E.; Adesogan, A.T.	Agronomy Journal	2021	10.1002/agj2.20954	4	This paper discusses the status of forage conservation across sub-Saharan Africa (SSA) and recommends strategic interventions and technologies to improve the quantity, quality, safety, pricing, and utilization of preserved forages in SSA.
1	The Southern Ocean Exchange: porous boundaries between humpback whale breeding populations in southern polar waters	Marcondes, M.C.C.; Cheeseman, T.; Jackson, J.A.; Friedlaender, A.S.; Pallin, L.; Olio, M.; Wedekin, L.L.; Daura-Jorge, F.G.; Cardoso, J.; Santos, J.D.F.; Fortes, R.C.; Araujo, M.F.; Bassoi, M.; Beaver, V.; Bombosch, A.; Clark, C.W.; Denkinger, J.; Boyle, A.; Rasmussen, K.; Savenko, O.; Avila, I.C.; Palacios, D.M.; Kennedy, A.S.; Sousa-Lima, R.S.	Scientific Reports	2021	10.1038/s41598-021-02612-5	4	We present new evidence of summer co-occurrence in the West Antarctic Peninsula feeding area of two recovering humpback whale breeding populations from the Atlantic (Brazil) and Pacific (Central and South America).
1	Identification of climate induced optimal rice yield and vulnerable districts rankings of the Punjab, Pakistan	Janjua, A.A.; Aslam, M.; Sultana, N.; Batool, Z.	Scientific Reports	2021	10.1038/s41598-021-02691-4	2	It is not a study of perception, and it deals with the extensive cultivation of rice.
6	When We're on the Ice, All We Have is Our Inuit Qaujimajatuqangit: Mobilizing Inuit Knowledge as a Sea Ice Safety Adaptation Strategy in Mittimatalik, Nunavut	Wilson, K.J.; Arreak, A.; Itulu, J.; Ljubicic, G.J.; Bell, T.	Artic	2021	10.14430/arctic74212	4	This paper presents an Inuit-led, coproduced, cross-cultural research project in which Inuit youth documented and mobilized sea ice Qaujimajatuqangit (IQ) in Mittimatalik (Pond Inlet), Nunavut for safe community sea ice travel. We outline the Inuit youth training to facilitate the terminology and participatory mapping workshops and to document this IQ.
1	Converting monospecific into mixed forests: stakeholders' views on ecosystem services in the Black Forest Region	Almeida, I.; Rosch, C.; Saha, S.	Ecology and Society	2021	10.5751/ES-12723-260428	3	The summary mentions that questionnaires on the perception of ecosystem services were applied to stakeholders, it does not mention any specific small-scale community.
1	Agriculture in relation to socioeconomic status of Tharu in Chitwan of Nepal	Sharma, S.; Yadav, P.K.; Dahal, R.; Shrestha, S.K.; Bhandari, S.; Thapaliya, K.P.	Journal of Agriculture and Food Research	2021	10.1016/j.jafr.2021.100243	4	Only socioeconomic data were collected by this study. It does not mention impact or perception of climate change.
7	Smallholder farmers' perceptions and adaptation strategies to mitigate the effect of climate change in the oases of South-Eastern Tunisia	Ozsayin, D.; Korkmaz, M.	New Medit	2021	10.30682/nm2105a	4	This research uses a bottom-up approach, which seeks to gain insights from the farmers themselves based on a farm household in the south-east of Tunisia. Probit binary models were estimated to determine the factors influencing adaptation strategies. All actions aimed at improving the resilience of agriculture in Tunisia's arid regions to climate change, emphasize mainly the strategies adopted by farmers in terms of water management, technical choices and the adopted production systems combined with the experience and local know-how.
1	Bluster or Lustre: Can AI Improve Crops and Plant Health?	Gardiner, L.J.; Krishna, R.	Plants-Basel	2021	10.3390/plants10122707	4	This review explores current research in the area to convey the state-of-the-art as to how Artificial Intelligence (AI)/ Machine Learning (ML) have been used to advance research, gain insights, and generally enable progress in this area.
1	Soil Health Assessment and Management: Recent Development in Science and Practices	Guo, M.X.	Soil Systems	2021	10.3390/soilsystems5040061	4	It is a study of soil health.
1	The Future of Marine Spatial Planning-Perspectives from Early Career Researchers	von Thenen, M.; Armoskaite, A.; Cordero-Penin, V.; Garcia-Morales, S.; Gottschalk, J.B.; Gutierrez, D.; Ripken, M.; Thoya, P.; Schiele, K.S.	Sustainability	2021	10.3390/su132413879	4	Study on Spatial Planning/Ordering of Marine Areas.
1	Analysis of Regional Water and Energy Consumption Considering Economic Development	Liu, J.; Xie, N.M.; Yu, Z.B.	Water	2021	10.3390/w13243582	4	This paper analyzed the water and energy footprints in different provinces of China, considering regional economic levels.
1	Risk Factors in Various Climates of Wheat Production in Western Iran: Experts' Opinions	Ranjbar, Z.; Chizari, M.; Sadighi, H.; Farhadian, H.; Lebailly, P.; Dogot, T.; Rojas, J.A.O.; Parra-Acosta, Y.K.; Azadi, H.	Agriculture-Basel	2021	10.3390/agriculture11121227	3	Questionnaires applied to scientists/specialists in the field of agriculture.
1	Access, Uptake, Use and Impacts of Agrometeorological Services in Sahelian Rural Areas: The Case of Burkina Faso	Tarchiani, V.; Coulibaly, H.; Baki, G.; Sia, C.; Burrone, S.; Nikiema, P.M.; Migraine, J.B.; Camacho, J.	Agronomy-Basel	2021	10.3390/agronomy11122431	4	Our work aims to demonstrate the hypothesis that agrometeorological services can effectively improve agricultural productivity and sustainability provided that appropriate mechanisms are put in place to ensure access, uptake and action. The paper illustrates the case study of Burkina Faso, where the National Meteorological Service, with the support of the World Meteorological Organization, engaged in the provision of accessible, reliable and relevant agrometeorological services for farmers.
1	Farmer Perceptions of Agricultural Risks; Which Risk Attributes Matter Most for Men and Women	Osiemo, J.; Ruben, R.; Girvetz, E.	Sustainability	2021	10.3390/su132312978	4	Our analysis of the risk perceptions of farmers extends beyond production risks, severity of the risks, and their likelihoods. We first characterize agricultural risks and identify their main sources and consequences. We then analyze risk perceptions as a hierarchical construct using partial least squares path modelling. We determine the most important risks and risk attributes in the perceptions of farmers, and test for differences in the perceptions between men and women.

1	Options to Support Sustainable Trajectories in a Rural Landscape: Drivers, Rural Processes, and Local Perceptions in a Colombian Coffee-Growing Region	Valbuena, D.; Chenet, J.G.; Gaitan-Cremaschi, D.	Sustainability	2021	10.3390/su132313026	2	Article aimed at coffee producers for commercialization.
1	The effect of the productive safety net programme on household food consumption and dietary diversity in Ethiopia	Feyisa, M.N.	African Journal of Agricultural and Resource Economics-Afjare	2021	10.20944/preprints202110.0172.v1	4	This study empirically investigates the effect of the productive safety net programme (PSNP) on household food consumption and dietary diversity in Ethiopia.
1	Smallholder farmer coping and adaptation strategies during the 2015-18 drought in the Western Cape, South Africa	Fanadzo, M.; Ncube, B.; French, A.; Belete, A.	Physics and Chemistry of the Earth	2021	10.1016/j.pce.2021.102986	6	Study in towns (There are 25 towns in the Overberg District. Seven of them were chosen for this study, namely Swellendam, Elim, Napier, Bredasdorp, Suurbrak, Genadendal and Barrydale. The West Coast District has 34 towns and 5 of them were selected, namely Vredendal, Goedverwacht, Hopefield, Lamberts Bay and Darling).
1	Farmers' maladaptation: Eroding sustainable development, rebounding and shifting vulnerability in smallholder agriculture system	Asare-Nuamah, P.; Dick-Sagoe, C.; Ayivor, R.	Environmental Development	2021	10.1016/j.envdev.2021.100680	4	Article focused on forms of adaptation.
1	Wetland changes and their impacts on livelihoods in Chiang Saen Valley, Chiang Rai Province, Thailand	Hempattarasuwan, N.; Untong, A.; Christakos, G.; Wu, J.P.	Regional Environmental Change	2021	10.1007/s10113-021-01842-7	4	This study aims to classify and quantify the levels of change in the Wiang Nong Lom and Nong Luang wetlands (Chiang Saen Valley, Chiang Rai Province, Thailand) and their impact on local livelihoods.
1	The impact of farmers' assessments of risk management strategies on their adoption willingness	Shang, Y.; Xiong, T.	Journal of Integrative Agriculture	2021	10.1016/S2095-3119(21)63749-8	4	This study conducts a structured survey of 469 farmers to investigate how farmers assess both crop insurance and crop price insurance, the impact of the assessments on their adoption willingness, and in particular, the differences in assessments and adoption willingness between crop insurance and crop price insurance.
1	Incorporating the life stages of fish into habitat assessment frameworks: A case study in the Baihetan Reservoir	Liu, Q.Y.; Zhang, P.; Cheng, B.X.; Li, Y.; Li, J.; Zhou, H.H.; Sun, G.; Qing, J.; Zhu, Z.X.; Lu, Y.; Zhao, P.X.	Journal of Environmental Management	2021	10.1016/j.jenvman.2021.113663	4	It is a study on the life cycle of fish.
1	The determinants of common bean variety selection and diversification in Colombia	Botero, H.; Barnes, A.P.; Perez, L.; Rios, D.; Ramirez-Villegas, J.	Ecological Economics	2021	10.1016/j.ecolecon.2021.107181	6	We investigate the drivers behind common bean variety selection and diversification in one of the most important common bean production regions in Colombia —Santander.
1	Livelihood capital, evacuation and relocation willingness of residents in earthquake-stricken areas of rural China	Zhou, W.F.; Ma, Z.X.; Guo, S.L.; Deng, X.; Xu, D.D.	Safety Science	2021	10.1016/j.ssci.2021.105350	4	Article is about the evacuation and relocation of populations close to earthquake risk areas.
1	Attributes of climate resilience in fisheries: From theory to practice	Mason, J.G.; Eurich, J.G.; Lau, J.D.; Battista, W.; Free, C.M.; Mills, K.E.; Tokunaga, K.; Zhao, L.Z.; Dickey-Collas, M.; Valle, M.; Pecl, G.T.; Cinner, J.E.; McClanahan, T.R.; Allison, E.H.; Friedman, W.R.; Silva, C.; Yanez, E.; Barbieri, M.A.; Kleisner, K.M.	Fish and Fisheries	2021	10.1111/faf.12630	4	We develop and apply a comprehensive resilience framework to examine fishery systems across (a) ecological, (b) socio-economic and (c) governance dimensions using five resilience domains: assets, flexibility, organization, learning and agency.
1	Farm-level autonomous adaptation to climate change and its impact on crop productivity: evidence from Pakistan	Khan, N.A.; Gong, Z.W.; Shah, A.A.; Abid, M.; Khanal, U.	Environment Development and Sustainability	2021	10.1007/s10668-021-01978-w	2	This study explored rice farmers' on-farm autonomous adaptation (OFAA) strategies to climate change and evaluated their impact on rice yield and total crop returns.
1	COVID-19 pandemic and sudden rise in crop residue burning in India: issues and prospects for sustainable crop residue management	Ravindra, K.; Singh, T.; Mor, S.	Environmental Science and Pollution Research	2021	10.1007/s11356-021-17550-y	4	Analyzes impacts of COVID-19 on increasing agricultural waste burning in India.
1	Ongoing climate crises and obstacles to adaptation: Observations from the Ditsobotla Local Municipality, South Africa	Pienaar, A.; Coetzee, C.; Nemakonde, L.	TD-The Journal for Transdiciplinary Research in Southern Africa	2021	10.4102/td.v17i1.1089	4	The study intended to explore the factors constraining the implementation of climate change adaptation strategies amongst commercial and subsistence farmers of the Local Municipality in the North West province, South Africa.
1	Wildlife impacts and changing climate pose compounding threats to human food security	Salerno, J.; Stevens, F.R.; Gaughan, A.E.; Hilton, T; Bailey, K.; Bowles, T.; Cassidy, L.; Mupeta-Muyamwa, P.; Biggs, D.; Pricope, N.; Mosimane, A.W.; Henry, L.M.; Drake, M.; Weaver, A; Kosmas, S.; Woodward, K.; Kolarik, N.; Hartter, J.	Current Biology	2021	10.1016/j.cub.2021.08.074	4	Study examines how human-wildlife impacts interact with climate change and household food insecurity across the Kavango-Zambezi Transfrontier Conservation Area, the world's largest terrestrial transboundary conservation area, spanning five African nations.
1	Risks and risk responses of rice farmers in the Mekong Delta, Vietnam	Nguyen, K.T.; Ho, C.H.P.; Trinh, D.C.	Letters in Spatial and Resource Sciences	2021	10.1007/s12076-021-00290-5	2	The objective of this paper is to investigate the risk facing rice farmers and the impact of risk mitigation strategies on profit of the farmers in the Mekong Delta.
1	Climate change risk perception and adaptive behavior of coffee farmers: the mediating role of climate-related attitudinal factors and moderating role of self-efficacy	Tran, T.T.; Chen, H.	Journal of Environmental Studies and Sciences	2021	10.1007/s13412-021-00732-y	2	This study explores the impact of climate change risk perception (CCRP) on adaptation behavior of coffee farmers and explores the mediating role of climate-related attitudinal factors and the moderating role of self-efficacy in the relationship between climate change risk perception and adaptation behavior.
1	Adolescents' thoughts and feelings about the local and global environment: a qualitative interview study	Thompson, R.; Fisher, H.L.; Dewa, L.H.; Hussain, T.; Kabba, Z.; Toledano, M.B.	Child and Adolescente Mental Health	2021	10.1111/camh.12520	3	Questionnaires applied to adolescents , not necessarily linked to small-scale communities.

1	Reducing Mediterranean Seafood Footprints: The role of consumer attitudes	Altiok, S.; Murthy, A.; Iha, K.; Galli, A.	Ocean & Coastal Management	2021	10.1016/j.ocecoaman.2021.105915	4	It deals with cultural preferences for seafood consumption and choices to reduce the ecological footprint.
1	Factors affecting smallholder farmers' technical and non-technical adaptation responses to drought in Iran	Zobeidi, T.; Yazdanpanah, M.; Komendantova, N.; Sieber, S.; Lohr, K.	Journal of Environmental Management	2021	10.1016/j.jenvman.2021.113552	4	The questionnaires deal with technical or non-technical adaptations to droughts, and their different contexts of choice.
1	Yield trends and variabilities explained by climatic change in coastal and non-coastal areas of Bangladesh	Hasan, M.K.; Kumar, L.	Science of the Total Environment	2021	10.1016/j.scitotenv.2021.148814	4	Estimates climate variations in coastal areas through mixed effects models.
1	Cultural worldviews consistently explain bundles of ecosystem service prioritisation across rural Germany	Peter, S.; Le Provost, G.; Mehring, M.; Muller, T.; Manning, P.	People and Nature	2021	10.1002/pan3.10277	4	Focused on ecosystem services and conflicts between stakeholders results from differences in cultural worldviews about the environment and its resources.
1	Non-DRR NGOs strategies for livelihood development in the coastal communities of Bangladesh: a case study	Seddiky, M.A.; Giggins, H.; Gajendran, T.	Natural Hazards	2021	10.1007/s11069-021-05097-7	4	This study aimed to assess the effectiveness of non-DRR NGOs' programs focusing on their contribution to the uplift livelihood of the disaster-affected coastal communities.
1	Schematizing vulnerability perceptions and understanding of drought-prone Gamo lowland communities: an evidence from Southwest Ethiopia	Tora, T.T.; Degaga, D.T.; Utallo, A.U.	International Journal of Climate Change Strategies and Management	2021	10.1108/IJCCSM-04-2021-0034	4	this study aims to schematize community perceptions and understanding of vulnerability in drought-affected rural Gamo lowlands. Design/methodology/approach.
1	Success and failure factors for increasing Sub-Saharan African smallholders' resilience to drought through water management	Nzeyimana, L.; Danielsson, A.; Andersson, L.; Gyberg, V.B.	International Journal of Water Resources Development	2021	10.1080/07900627.2021.1991285	4	This article analyses the success and failure factors underlying smallholder farmers' resilience to drought in Sub-Saharan Africa based on a literature review of the period 2007-19.
1	Pastoral Livelihood Diversification and Gender in Borana, Southern Ethiopia	Anbacha, A.E.; Kjosavik, D.J.	Rangeland Ecology & Management	2021	10.1016/j.rama.2021.06.006	4	This study was undertaken in Borana, southern Ethiopia, to understand women's involvement in livelihood diversification, as well as their gains and losses.
1	A Comparison of Vulnerability Risks and Conservation Perceptions between Mariculture, Fishery and Ecotourism Livelihood Groups in a Multi-Use MPA in Indonesia	Albasri, H.; Sammut, J.	Sustainability	2021	10.3390/su132212897	4	It deals with the vulnerabilities of populations that inhabit marine protected areas and their perception of conservation efforts.
1	Development of a Scale to Remove Farmers' Sustainability Barriers to Meteorological Information in Iran	Valizadeh, N.; Haji, L.; Bijani, M.; Haghighi, N.F.; Fatemi, M.; Viira, A.H.; Parra-Acosta, Y.K.; Kurban, A.; Azadi, H.	Sustainability	2021	10.3390/su132212617	4	Study on Iranian farmers' access to meteorological information.
1	Glycine Betaine-Mediated Root Priming Improves Water Stress Tolerance in Wheat (Triticum aestivum L.)	Ahmed, N.; Zhu, M.Y.; Li, Q.X.; Wang, X.L.; Wan, J.C.; Zhang, Y.S.	AGRICULTURE-BASEL	2021	10.3390/agriculture11111127	4	We designed the present study to investigate the role of GB-mediated root priming in improving the water stress tolerance in wheat (cv. Jimai-22) under in-vitro conditions.
1	Are You Happy to Be a Farmer? Understanding Indicators Related to Agricultural Production and Influencing Factors: GAP-Sanliurfa, Turkey	Aydogdu, M.H.; Cancelik, M.; Sevinc, M.R.; Cullu, M.A.; Yeniguen, K.; Kuecuek, N.; Karli, B.; Oekten, S.; Beyazguel, U.; Dogan, H.P.; Sevinc, G.; Sahin, Z.; Mutlu, N.; Kaya, C.; Yenikale, A.; Yenikale, A.	Sustainability	2021	10.3390/su132212663	4	This study aimed to analyze the satisfaction levels of farmers in different irrigation areas in the Southeastern Anatolia Project (GAP)-Sanliurfa region, based on indicators related to agricultural production and influencing factors.
1	The 'Cod-Multiple': Modes of Existence of Fish, Science and People	Schwermer, H.; Bloecker, A.M.; Mollmann, C.; Doring, M.	Sustainability	2021	10.3390/su132112229	4	It deals with the incorporation of diverse knowledge of stakeholders on the management of fisheries resources.
1	Agricultural water saving through technologies: a zombie idea	Perez-Blanco, C.D.; Loch, A.; Ward, F.; Perry, C.; Adamson, D.	Environmental Research Letters	2021	10.1088/1748-9326/ac2fe0	4	It's a study on irrigation systems
1	Formal institutions' role in managing catastrophic risks in agriculture in Pakistan: Implications for effective risk governance	Khan, N.A.; Gong, Z.W.; Shah, A.A.; Leng, G.Y.	International Journal of Disaster Risk Reduction	2021	10.1016/j.ijdrr.2021.102644	3	This study attempted to highlight the role of formal institutions, their effectiveness, and constraints in managing catastrophic risks in agriculture in Pakistan.
1	Irrigation water management for sustainable cultivation of date palm	Dhaouadi, L.; Besser, H.; Karbout, N.; Al-Omran, A.; Wassar, F.; Wahba, M.S.; Yaohu, K.; Hamed, Y.	Applied Water Science	2021	10.1007/s13201-021-01507-0	4	Thus, the present paper attempts to evaluate accurately the evolution of the principal factors influencing date palm production and agricultural activities sustainability in the region.
1	Assessing the social vulnerability of small-scale farmer's to drought in uMsinga, KwaZulu-Natal	Lottering, S.J.; Mafongoya, P.; Lottering, R.T.	International Journal of Disaster Risk Reduction	2021	10.1016/j.ijdrr.2021.102568	4	"The aim of this article was to assess and identify social vulnerability amongst small-scale farmers and rural communities in the uMsinga community in the KwaZulu Natal province of South Africa using an adapted social vulnerability index (SoVI)."
1	Assessing the sustainability of traditional agroforestry practices: a case of Mamar agroforestry in Kupang-Indonesia	Ngaji, A.U.K.; Baiquni, M.; Suryatmojo, H.; Haryono, E.	Forest and Society	2021	10.24259/fs.v5i2.14380	4	"This study aims to assess the sustainability of Mamar agroforestry by analyzing the livelihood assests of the community, the biophysical land performance of the soil, and the value of ecosystem services. Furthermore, data, on perception and livelihood assets; the level of soil damage, the importance value index, and diversity index, the value of ecosystem services based on the opinion of experts and community leaders, as well as change in land use were collected in five villages in Kupang district using surveys with a qualitative and quantitative approach."

7	A systematic global stocktake of evidence on human adaptation to climate change	Berrang-Ford, L.; Siders, A.R.; Lesnikowski, A.; Fischer, A.P.; Callaghan, M.W.; Haddaway, N.R.; Mach, K.J.; Araos, M.; Shah, M.A.R.; Wannewitz, M.; Doshi, D.; Leiter, T.; Matavel, C; Musah-Surugu, J.I.; Wong-Parodi, G.; Antwi-Agyei, P.; Ajibade, I.; Chauhan, N.; Kakenmaster, W.; Grady, C.; Chalastani, V.I.; Jagannathan, K.; Galappaththi, E.K.; Sitati, A.; Scarpa, G; Totin, E; Davis, K.; Hamilton, N.C.; Kirchhoff, C.J.; Kumar, P.; Pentz, B.; Simpson, N.P.; Theokritoff, E.; Deryng, D.; Reckien, D.; Zavaleta-Cortijo, C.; Ulibarri, N.; Segnon, A.C.; Khavhagali, V; Shang, YY; Zvobgo, L; Zommers, Z; Xu, JR; Williams, PA; Canosa, IV; van Maanen, N; van Bavel, B; van Aalst, M; Turek-Hankins, LL; Trivedi, H; Trisos, CH; Thomas, A; Thakur, S; Templeman, S; Stringer, LC; Sotnik, G; Sjostrom, KD; Singh, C; Sina, MZ; Shukla, R; Sardans, J; Salubi, EA; Chalkasra, LSS; Ruiz-Diaz, R; Richards, C; Pokharel, P; Petzold, J; Penuelas, J; Avila, JP; Murillo, JBP; Ouni, S; Niemann, J; Nielsen, M; New, M; Schwerdtle, PN; Alverio, GN; Mullin, CA; Mullenite, J; Mosurska, A; Morecroft, MD; Minx, JC; Maskell, G; Nunbogu, AM; Magnan, AK; Lwasa, S; Lukas-Sithole, M; Lissner, T; Lilford, O; Koller, SF; Jurjonas, M; Joe, ET; Huynh, LTM; Hill, A; Hernandez, RR; Hegde, G; Hawxwell, T.; Harper, S; Harden, A; Haasnoot, M; Gilmore, E.A.; Gichuki, L; Gatt, A; Garschagen, M; Ford, J.D.; Forbes, A; Farrell, A.D.; Enquist, C.A.F.; Elliott, S; Duncan, E; de Perez, EC; Coggins, S.; Chen, T; Campbell, D; Browne, K.E.; Bowen, K.J.; Biesbroek, R; Bhatt, I.D.; Kerr, R.B.; Barr, S.L.; Baker, E; Austin, S.E.; Arotoma-Rojas, I; Anderson, C; Ajaz, W; Agrawal, T; Abu, T.Z.	Nature Climate Change	2021	10.1038/s41558-021-01170-y	8	It's a review on global adaptation to climate change. We systematically screened >48,000 articles using machine learning methods and a global network of 126 researchers.
1	Reducing Invasive Species Transport among Recreational Anglers: The Importance of Values and Risk Perceptions	Golebie, E.; van Riper, C.J.; Suski, C.; Stedman, R.	North American Journal of Fisheries Management	2021	10.1002/nafm.10696	4	"Therefore, this study assessed the relationships among values, risk perceptions, and reported aquatic invasive species prevention behavior to inform management decisions aimed at minimizing angler transport of aquatic invasive species."
1	A Qualitative Study on How Perceptions of Environmental Changes are Linked to Migration in Morocco, Senegal, and DR Congo	Van Praag, L.; Lietaer, S.; Michellier, C.	Human Ecology	2021	10.1007/s10745-021-00278-1	3	The abstract doesn't specify if whether respondents are small-holders or not.
1	Farmers' knowledge, attitudes, and perceptions for the adoption of in-field rainwater harvesting (IRWH) technique in Thaba Nchu, South Africa	Dzvene, A.R.; Tesfuhuney, W.; Walker, S.; Fourie, A.; Botha, C.; Ceronio, G.	African Journal of Science Technology Innovation & Development	2021	10.1080/20421338.2021.1960542	4	A systematic engagement strategy was used to identify contextual factors that prevent farmers from accepting the in-field rainwater harvesting (IRWH) technique. The purpose of the qualitative study is to assess farmers' knowledge and attitudes about the technique, as well as their adoption and perceptions thereof.
1	Drivers of Climate Change Risk Perceptions among Diverse Forest Stakeholders in Maine, USA	Soucy, A.; De Urioste-Stone, S.; Rahimzadeh-Bajgiran, P.; Weiskittel, A.	Society & Natural Resources	2021	10.1080/08941920.2021.1991066	3	We distributed the survey to 1,400 randomly selected forestry stakeholders from the Maine Woodland Owners (SWOAM) Association and the University of Maine’s Cooperative Forestry Research Unit (CFRU).
1	Linking climate change adaptation practices with farm technical efficiency and fertilizer use: a study of wheat-maize mix cropping zone of Punjab province, Pakistan	Shahbaz, P.; ul Haq, S.; Boz, I.	Environmental Science and Pollution Research	2021	10.1007/s11356-021-16844-5	2	Punjab is the country’s leading agricultural province, and the abstract doesn't mention small-scale populations.

1	Spatio-temporal estimation of the anthropogenic environmental stress intensity in the Three-River-Source National Park region, China	Zhou, K.; Wu, J.Y.; Liu, H.C.	Journal of Cleaner Production	2021	10.1016/j.jclepro.2021.128476	4	"Taking the Three-River-Source National Park (TRSNP) region as a typical case study, based on the spatial identification of anthropogenic pollution and the estimation of water and air pollutant emissions, this study quantitatively evaluates the environmental stress intensity and analyzes its spatial effects from the perspective of point-line-plane stress characteristics."
1	More exposure opportunities for promoting freshwater conservation	He, F.Z.; Jahnig, S.C.; Wetzig, A.; Langhans, S.D.	Aquatic Conservation-Marine and Freshwater Ecosystems	2021	10.1002/aqc.3725	4	Review on freshwater conservation journals.
1	Climate change literacy in Africa	Simpson, N.P.; Andrews, T.M.; Kronke, M.; Lennard, C.; Odoulami, R.C.; Ouweneel, B.; Steynor, A.; Trisos, C.H.	Nature Climate Change	2021	10.1038/s41558-021-01171-x	3	Isn't specific about small-scale populations.
1	Can agriculture and conservation be compatible in a coastal wetland? Balancing stakeholders' narratives and interactions in the management of El Hondo Natural Park, Spain	Ricart, S.; Rico-Amoros, A.M.	Agriculture and Human Values	2021	10.1007/s10460-021-10271-5	4	"This paper analyses the complex balance between agriculture and conservation coexistence in El Hondo Natural Park (Alicante, Spain) coastal wetland by examining stakeholders' narratives, perceptions, and interactions. The aim is to highlight the concurrence between socio-economic progress and socio-environmental justice perspectives by identifying those driving factors motivating stakeholders' conflicts while expanding stakeholders' behaviour and interaction when discussing the current and future management of this socio-ecological system."
1	Discourses for deep transformation: perceptions of economic growth in two rural communities in Lower Saxony, Germany	Lubker, H.M.; Abson, D.J.; Riechers, M.	Sustainability Science	2021	10.1007/s11625-021-01039-1	4	This article explores perceptions of economic growth among people who lives in rural areas.
1	Adaptations of market garden producers to climate change in southern Mali	Soumaoro, T.	GeoJournal	2021	10.1007/s10708-021-10516-0	3	"This article aims to determine the factors that influence the choice of adaptation measures by market gardeners in the extreme south of Mali in the face of climate change."
1	Farmers' Perception, Adaptation to Groundwater Salinity, and Climate Change Vulnerability: Insights from North India	Mitra, S.; Mehta, P.K.; Mishra, S.K.	Weather Climate and Society	2021	10.1175/WCAS-D-20-0135.1	4	This paper represents an important study by exploring the same in Mewat, a salinity-affected socioeconomically disadvantaged district of northern India. The study uses a mixed-method approach with both secondary data and a primary survey of 250 farmers.
1	Roman Climate Awareness in Pliny the Elder's Natural History	Millar, J.	Classical Antiquity	2021	10.1525/ca.2021.40.2.249	4	This article examines the past and potential contributions of Pliny the Elder's Natural History (NH) on the subject of Roman perceptions and experiences of environmental change.
1	Leveraging Japanese Sado Island Farmers' GIAHS Inclusivity by Understanding Their Perceived Involvement	Maharjan, K.L.; Gonzalvo, C.M.; Aala, W.F.	Sustainability	2021	10.3390/su132011312	4	"This study explored whether farmer visibility, which is highlighted by GIAHS designation, actually translates to farmers' actual perceptions of GIAHS involvement."
1	Reorienting climate decision making research for smallholder farming systems through decision science	Waldman, K.B; Guido, Z.; Todd, P.M.; Evans, T.P.; Carrico, A.; Attari, S.Z.	Current Opinion in Environmental Sustainability	2021	10.1016/j.cosust.2021.08.002	8	"In the following article we look at recent findings from decision science to explore why and how research should be reoriented to provide insight into climate related decision making among smallholder farmers in areas with limited infrastructure and few public services."
1	Impact of Internet Information on Apple Growers' Adaptive Behaviors to Frost Disasters: Theory and Empirical Research from the Perspective of Psychological Perception	Yang, H.Y.; Cai, W.C.; Liu, J.D.; Huo, X.X.	Agriculture-Basel	2021	10.3390/agriculture11100905	3	This paper constructed the theoretical analysis framework of Apple growers' internet information acquisition-psychological perception-adaptive behavior to frost disaster , based on the data of 1020 apple growers in Shaanxi Province
1	Barriers to scaling sustainable land and water management in Uganda: a cross-scale archetype approach	Piemontese, L.; Kamugisha, R.N.; Tukahirwa, J.M.B.; Tengberg, A.; Pedde, S.; Jaramillo, F.	Ecology and Society	2021	10.5751/ES-12531-260306	4	"Here, we propose a cross-scale archetype approach to identify and link barriers to SLWM adoption in Uganda. We performed 80 interviews across the country to build cognitive archetypes, harvesting stakeholders' perceptions of different types of barriers."
1	Conducting an Evaluation Framework of Importance-Performance Analysis for Sustainable Forest Management in a Rural Area	Chen, H.C.; Tseng, T.P.; Cheng, K.; Sriarkarin, S.; Xu, W.Y.; Ferdin, A.E.J.; Nguyen, V.; Zong, C.; Lee, C.H.	Forests	2021	10.3390/f12101357	4	"We established an evaluation framework for sustainable forest management (SFM) development based on locals' perspectives using the importance-performance analysis (IPA) method in a rural area of Taiwan."
1	Tree Cover Loss in the Mediterranean Region-An Increasingly Serious Environmental Issue	Ciobotaru, A.M.; Patel, N.; Pintilii, R.D.	Forests	2021	10.3390/f12101341	4	"This study presents a thorough approach based on the application of Landsat imagery from Global Forest Change during 2001-2019. Spatial distribution mapping was one of the objectives of the study."
1	An assessment of regulation, education practices and socio-economic perceptions of non-native aquatic species in the Balkans	Piria, M.; Kalamujic Stroil, B.; Giannetto, D.; Tarkan, A.S.; Gavrilovi, A.; Speli, I.; Radocaj, T.; Killi, N.; Filiz, H.; Ucma Uysal, T.; Aldemir, C.; Kamberi, E.; Hala, E.; Bakiu, R.; Kolitari, J.; Buda, E.; Durmishaj Bakiu, S.; Sadiku, E.; Bakrac, A.; Mujic, E.; Avdic, S.; Doumpas, N.; Giovos, I.; Dinoshi, I.; Usanovic, L.; Kalajdzic, A.; Pesic, A.; Cetkovic, I.; Markovic, O.; Milosevic, D.; Mrdak, D.; Sara, G.; Belmar, M.B.; Marchessaux, G.; Trajanovski, S.; Zdraveski, K.	Journal of Vertebrate Biology	2021	10.25225/jvb.21047	4	"The objectives and tasks of this study were to address the policy regulation, education level, education practices, and socioeconomic perceptions of NNS in the Balkans." NNS = non-native aquatic species
1	Living with Urban Flooding: A Continuous Learning Process for Local Municipalities and Lessons Learnt from the 2021 Events in Germany	Bosseler, B.; Salomon, M.; Schluter, M.; Rubinato, M.	Water	2021	10.3390/w13192769	6	This study was conducted in german urban municipalities.

1	Transhumant pastoralist knowledge of infectious diseases and adoption of alternative land use strategies in the Hindu-Kush Himalayan (HKH) region of Pakistan	Ullah, A.; Zeb, A.; Liu, J.L.; Mahmood, N.; Kachele, H.	Land Use Policy	2021	10.1016/j.lusepol.2021.105729	4	"This study aimed to identify the factors that affect transhumant communities' awareness of recently emerged Coronavirus Disease 2019 (COVID-19) in humans and foot and mouth disease (FMD) in animals."
1	Contribution of ecosystem services to rural livelihoods in a changing landscape: A case study from the Eastern Himalaya	Chettri, N.; Aryal, K.; Thapa, S.; Uddin, K.; Kandel, P.; Karki, S.	Land Use Policy	2021	10.1016/j.lusepol.2021.105643	4	This article aims to identify ecosystem services and its benefits to rural livelihoods.
1	Co-production of risk knowledge and improvement of risk communication: A three-legged stool	Lejano, R.P.; Haque, C.E.; Berkes, F.	International Journal of Disaster Risk Reduction	2021	10.1016/j.ijdrr.2021.102508	8	Theoretical work about public knowledge to disaster risk reduction
1	Flood risk perception and responses among urban residents in the northeastern United States	Zinda, J.A.; Williams, L.B.; Kay, D.L.; Alexander, S.M.	International Journal of Disaster Risk Reduction	2021	10.1016/j.ijdrr.2021.102528	6	Location: Troy, New York (U.S.)
1	Nexus between flooding impacts and coping strategies in Nairobi's settlements	Owuor, M.O.; Mwiturubani, D.A.	International Journal of Disaster Risk Reduction	2021	10.1016/j.ijdrr.2021.102480	6	Location: Nairobi
1	Meteorological forecasting and artisanal fishing: Filling knowledge gaps for safety at sea	Alves, L.D.; Di Beneditto, A.P.M.; Quaresma, V.D.; Zappes, C.A.	Environmental Science & Policy	2021	10.1016/j.envsci.2021.06.020	4	"The aim of the present study is thus to investigate whether the language used by official Brazilian forecasting institutes is understood by artisanal fishermen in the northern area of the state of Rio de Janeiro, southeastern Brazil and to propose a better use of forecasts by the fishing community."
1	Sustainability challenges of adaptation interventions: do the challenges vary with implementing organizations?	Rahman, S.M.	Mitigation and Adaptation Strategies for Global Change	2021	10.1007/s11027-021-09966-1	4	"In this paper, we use case study analysis to focus on three specific adaptation interventions-homestead plinth level raise, pond sand filter for safe drinking water, and surface and groundwater irrigation-in Bangladesh."
1	Determinants of reactive adaptations to climate change in semi-arid region of Pakistan	Shahid, R.; Shijie, L.; Shahid, S.; Altaf, M.A.; Shahid, H.	Journal of Arid Environments	2021	10.1016/j.jaridenv.2021.104580	2	Based on survey from 200 rice growers of Pakistan
1	Northern Australia Climate Program: supporting adaptation in rangeland grazing systems through more targeted climate forecasts, improved drought information and an innovative extension program	Cobon, D.; Jarvis, C.; Reardon-Smith, K.; Guillory, L.; Pudmenzky, C.; Nguyen-Huy, T.; Mushtaq, S.; Stone, R.	Rangeland Journal	2021	10.1071/RJ20074	4	"The development and extension components of the program aim to improve climate literacy and the use of climate information."
1	Examining farmers' adoption of nutrient management best management practices: a social cognitive framework	Gao, L.J.; Arbuckle, J.	Agriculture and Human Values	2021	10.1007/s10460-021-10266-2	4	"This research employed social cognitive theory and previous research around the conceptual category of motivations to inform the study of relationships between the dynamic precursors and later modifiers of farmers' adoption of in-field nutrient management Best Management Practices."
1	Investigating dynamic interconnections between organic farming adoption and freshwater sustainability	Aivazidou, E.; Tsolakis, N.	Journal of Environmental Management	2021	10.1016/j.jenvman.2021.112896	4	"This research adopts a systems thinking perspective on the transition from conventional to organic agriculture."
1	Understanding Local Perceptions of the Drivers/Pressures on the Coastal Marine Environment in Palawan, Philippines	Madarcos, J.R.V.; Creencia, L.A.; Roberts, B.R.; White, M.P.; Nayoan, J.; Morrissey, K.; Fleming, L.E.	Frontiers in Marine Science	2021	10.3389/fmars.2021.659699	4	The abstract doesn't mention CC as a perceived pressure on the coastal marine environment.
1	Environmentally friendly farming and yield of wheat crop: A case of developing country	Mustafa, G.; Mahmood, H.; Iqbal, A.	Journal of Cleaner Production	2021	10.1016/j.jclepro.2021.127978	4	"This study intends to quantify the impact of Changing Crop Variety (CCV), Changing Planting Dates (CPD), Tree Plantation (TP), and Soil Conservation (SC) strategies on the yield of wheat crop. We also test some farm-specific and farmer-specific determinants of the wheat yield."
1	Five culturally protected water body practices in Fiji: Current status and contemporarydisplacement challenges	Vave, R.	Ambio	2021	10.1007/s13280-021-01620-z	4	Theoretical work on community-based natural resource management.
1	Trajectories of cropping system intensification under changing environment in south-west coastal Bangladesh	Jamal, M.R.; Kristiansen, P.; Kabir, M.J.; Kumar, L.; De Bruyn, L.L.	International Journal of Agricultural Sustainability	2021	10.1080/14735903.2021.1975436	3	No mention to small-scale populations.
1	Young Adults' Reactions and Engagement with Short-form Videos on Sea Level Rise	Shriver-Rice, M.; Fernandes, J.; Johns, L.N.; Riopelle, C.; Vaughan, H.	Environmental Communication - A Journal of Nature and Culture	2021	10.1080/17524032.2021.1963800	3	"This study examines young South Floridians' perceptions of visual elements and four generic types of engagement identified via a novel interdisciplinary methodology"
1	A Burning Concern: Family Forest Owner Wildfire Concerns Across Regions, Scales, and Owner Characteristics	Danley, B.; Caputo, J.; Butler, B.J.	Risk Analysis	2021	10.1111/risa.13816	3	"[...] we investigate the relationship between landowners' wildfire concerns and biophysical wildfire hazard across the contiguous United States. "
1	The forest frontier in the Global South: Climate change policies and the promise of development and equity	Brockhaus, M.; Di Gregorio, M.; Djoudi, H.; Moeliono, M.; Pham, T.T.; Wong, G.Y.	Ambio	2021	10.1007/s13280-021-01602-1	4	"We analyse the politics and power in four cases of mitigation, adaptation, and development arenas."
1	Improving the economic sustainability of Italian farmers: An empirical analysis of decision-making models for insurance adoption	Fusco, G.; Vecchio, Y.; Porrini, D.; Adinolfi, F.	New Medit	2021	10.30682/nm2103d	4	"The paper, using Regional panel data from Italy Regions and the GMM dynamic panel data model, examines the effect of different group variables on agricultural insurance decision making: risk perception and management, agricultural insurance recognition, trust and affordability."

1	Valuation of Country Food in Nunavut Based on Energy and Protein Replacement	Warltier, D.W.; Landry-Cuerrier, M.; Humphries, M.M.	Arctic	2021	10.14430/arctic73390	4	"Here we estimate the replacement value of Nunavut country food by combining information on the amount and nutritional composition of harvested country food with the nutritional content and local price of store-bought food."
1	The evolving cultural values and their implications on the Maasai Pastoralists, Kajiado County, Kenya	Kaoga, J.; Olago, D.; Ouma, G.; Ouma, G.; Onono, J.	Scientific African	2021	10.1016/j.sciaf.2021.e00881	4	Focuses on cultural adjustments and their impacts on the Maasai pastoralists' societal needs.
1	Estimated Mortality and Morbidity Attributable to Smoke Plumes in the United States: Not Just a Western US Problem	O'Dell, K.; Bilsback, K.; Ford, B.; Martenies, S.E.; Magzamen, S.; Fischer, E.V.; Pierce, J.R.	Geohealth	2021	10.1029/2021GH000457	4	The aim of this study is to estimate and assess distribution the sub-national distribution of mortality and the sub-national and sub-annual distribution of asthma morbidity attributable to US smoke PM2.5 from 2006 to 2018, as well as disability-adjusted life years (DALYs) for PM2.5 and 18 gas-phase hazardous air pollutants (HAPs) in smoke.
1	Agrochemicals Use Practices and Health Challenges of Smallholder Farmers in Ghana	Demi, S.M.; Sicchia, S.R.	Environmental Health Insights	2021	10.1177/11786302211043033	4	This study seeks to address three questions: (1) What factors motivate/compel smallholder farmers in Ghana to use agrochemicals? (2) What safety precautions or unsafe chemical use practices can be found in the communities? (3) What are the health implications of agrochemical use among smallholder farmers in Ghana?
1	Communicating Drivers of Environmental Change Through Transdisciplinary Human-Environment Modeling	Allison, A.E.F.; Dickson, M.E.; Fisher, K.T.; Thrush, S.F.	Earth's Future	2021	10.1029/2020EF001918	4	Combines a scientific storytelling approach and agent-based modelling to understand public perception of changes in estuarine systems and its effects on a complex network of interactions.
1	Climate-Smart Agriculture: Sleeping Beauty of the Hungarian Agribusiness	Biro, K.; Csete, M.S.; Nemeth, B.	Sustainability	2021	10.3390/su131810269	2	The survey was applied to farms on Hungarian agribusiness.
1	Adoption of Conservation Agriculture in Rwanda: A Case Study of Gicumbi District Region	Murindangabo, Y.T.; Kopecky, M.; Konvalina, P.	Agronomy-Basel	2021	10.3390/agronomy11091732	4	"This study is targeted towards ascertaining the level of CA adoption in the Gicumbi district in relation to the socioeconomic status of the farming population, to suggest the relevant strategies for accelerating CA adoption specific to this region." CA= Conservation Agriculture
1	Climate Variability and Change Affect Crops Yield under Rainfed Conditions: A Case Study in Gedaref State, Sudan	Osman, M.A.A.; Onono, J.O.; Olaka, L.A.; Elhag, M.M.; Abdel-Rahman, E.M.	Agronomy-Basel	2021	10.3390/agronomy11091680	4	"This study aimed to investigate the impact of historical long-term climate (temperature and rainfall) variables on the yield of five major crops viz., sorghum, sesame, cotton, sunflower, and millet in Gedaref state, Sudan over the last 35 years."
1	Perceptions of Vegan Food among Organic Food Consumers Following Different Diets	Kilian, D.; Hamm, U.	Sustainability	2021	10.3390/su13179794	4	"This article identifies consumer segments for vegan food by analysing perceptions of vegan food among food organic consumers following different diets: vegans, vegetarians, former vegetarians, flexitarians, and omnivores."
1	Plant your street! A research game exploring tree selection and placement in an urban neighborhood	Davis, N.; Winter, P.L.	Urban Forestry & Urban Greening	2021	10.1016/j.ufug.2021.127244	4	"This project engaged visitors to public venues in the City of Los Angeles in a 'plant your street' research game."
1	What Drives the Use of Organic Fertilizers? Evidence from Rice Farmers in Indo-Gangetic Plains, India	Velayudhan, P.K.; Singh, A.; Jha, G.K.; Kumar, P.; Thanaraj, K.I.; Srinivasa, A.K.	Sustainability	2021	10.3390/su13179546	4	"In this context, we study the adoption of organic fertilizers in the region and the determining factors."
1	Scientists don't care about truth anymore': the climate crisis and rejection of science in Canada's oil country	Haney, T.J.	Environmental Sociology	2021	10.1080/23251042.2021.1973656	6	The survey was applied to victims of 2013 Southern Alberta Flood.
1	Economic, pro-social and pro-environmental factors influencing participation in an incentive-based conservation program in Bolivia	Authelet, M.; Subervie, J.; Meyfroidt, P.; Asquith, N.; Ezzine-de-Blas, D.	World Development	2021	10.1016/j.worlddev.2021.105487	4	"Here, we studied an incentive-based program for forest conservation in Bolivia - called Reciprocal Watershared Agreements - that mixes material compensations with pro-social and pro-environmental motivations as a way to reduce crowding-out of intrinsic motivations and to increase participation."
1	Mediterranean land system dynamics and their underlying drivers: Stakeholder perception from multiple case studies	Esgalhado, C.; Guimaraes, M.H.; Lardon, S.; Debolini, M.; Balzan, M.V.; Gennai-Schott, S.C.; Rojo, M.S.; Mekki, I.; Bouchemal, S.	Landscape and Urban Planning	2021	10.1016/j.lurbplan.2021.104134	4	Highlights Land system dynamics from seven Mediterranean case studies are discussed.
1	Prioritizing Beneficial Management Practices for Species at Risk in Agricultural Lands	Blouin, F.; Wilmshurst, J.F.; Harder, J.; Bloom, R.; Johns, D.W.; Watson, P.	Environmental Management	2021	10.1007/s00267-021-01525-3	4	"We present an eight-step model framework that allows agricultural producers to privately determine the potential SAR occurring in a land parcel of interest and to identify and prioritize mutually compatible and outcome-oriented BMPs relevant to these species." BMP= beneficiaal management practices
1	Non-random dispersal in sympatric stream fishes: Influences of natural disturbance and body size	Terui, A.; Kim, S.; Pregler, K.C.; Kanno, Y.	Freshwater Biology	2021	10.1111/fwb.13796	4	"Here, we examined how extreme high flows and individual body size combined to influence dispersal of three fishes (creek chub Semotilus atromaculatus, bluehead chub Nocomis leptocephalus, and striped jumprock Moxostoma rupicartes) in two streams (740 and 520 m long) in South Carolina, U.S.A."
1	Decision-making with ecological process for coastal and marine planning: current literature and future directions	Chamberlain, D.A.; Possingham, H.P.; Phinn, S.R.	Aquatic Ecology	2021	10.1007/s10452-021-09896-9	4	Review on how ecological processes are incorporating connectivity as a process in marine spatial planning.
1	Explaining intention to apply renewable energy in agriculture: the case of broiler farms in Southwest Iran	Yazdanpanah, M.; Komendantova, N.; Zobeidi, T.	International Journal of Green Energy	2021	10.1080/15435075.2021.1966792	4	"This paper focuses on one group of stakeholders, farmers in Iran, and investigates what factors influence their intention and willingness to use RES in the energy-intensive broiler industry."
1	Climate finance governance in hazard prone riverine islands in Bangladesh: pathway for promoting climate resilience	Sarker, M.N.I.; Peng, Y.; Khatun, M.N.; Alam, G.M.M.; Shouse, R.C.; Amin, M.R.	Natural Hazards	2021	10.1007/s11069-021-04983-4	4	"This article examines the role of climate finance governance at the vulnerable hazard-prone chars in Bangladesh. "
1	Stakeholder perceptions about the drivers, impacts and barriers of certification in the Ghanaian cocoa and oil palm sectors	Dompreh, E.B.; Asare, R.; Gasparatos, A.	Sustainability Science	2021	10.1007/s11625-021-01027-5	4	"This article aims to synthesizes the perceptions of the main relevant stakeholder about the drivers, impacts, and challenges of cocoa and oil palm certification in Ghana."
1	Use of auxin to delay ripening: sensory and biochemical evaluation of Cabernet Sauvignon and Shiraz	Bottcher, C.; Johnson, T.E.; Burbidge, C.A.; Nicholson, E.L.; Boss, P.K.; Maffei, S.M.; Bastian, S.E.P.; Davies, C.	Australian Journal of Grape and Wine Research	2021	10.1111/ajgw.12516	4	"This study extends previous findings about the effect of NAA on Shiraz fruit and wine composition and provides the first analysis of NAA-induced ripening delay of Cabernet Sauvignon." NAA= Naphthalene acet acid
1	Long-term response in nutrient load from commercial forest management operations in a mountainous watershed	Deval, C.; Brooks, E.S.; Gravelle, J.A.; Link, T.E.; Dobre, M.; Elliot, W.J.	Forest Ecology and Management	2021	10.1016/j.foreco.2021.119312	4	"We investigated the effect of contemporary forest management activities, including clear-cutting and thinning, on water yield and stream nitrogen and phosphorus dynamics in a quarter-centurylong (1992-2016) paired and nested watershed study in the interior Pacific Northwest, US."

1	Ask the Locals: A Community-Informed Analysis of Perceived Marine Environment Quality Over Time in Palawan, Philippines	Sumeldan, J.D.C.; Richter, I.; Avillanosa, A.L.; Bacosa, H.P.; Creencia, L.A.; Pahl, S.	Frontiers in Psychology	2021	10.3389/fpsyg.2021.661810	4	"This article aims to understand the perceptions of coastal communities of local environmental issues, specifically how these have developed over time, to understand the expectations and perceptions of trends."
1	Decision spaces in agricultural risk management: a mental model study of Austrian crop farmers	Hanger-Kopp, S.; Palka, M.	Environment Development and Sustainability	2021	10.1007/s10668-021-01693-6	4	"In this paper, we comprehensively investigate farmers' decision spaces with respect to drought risk management."
1	Crop-climate model in support of adjusting local ecological calendar in the Taxkorgan, eastern Pamir Plateau	Yang, H.Z.; Ranjitkar, S.; Xu, W.X.; Han, L.; Yang, J.B.; Wu, L.Q.; Xu, J.C.	Climatic Change	2021	10.1007/s10584-021-03204-y	4	"This study aims to explore observed changes in the crop calendar and changes in crop yield as response to climatic variability to support adjusting the local crop calendar."
1	Could Japonica Rice Be an Alternative Variety for Increased Global Food Security and Climate Change Mitigation?	Uyeh, D.D.; Asem-Hiablie, S.; Park, T.; Kim, K.; Mikhaylov, A.; Woo, S.; Ha, Y.	Foods	2021	10.3390/foods10081869	4	"A comparison of the growing climate and greenhouse gas emissions of Japonica and Indica rice was carried out by reviewing previous studies."
1	Cattle Ranching and Farmer-herder Conflicts in sub-Saharan Africa: Exploring the Conditions for Successes and Failures in Northern Ghana	Ahmed, A.; Kuusaana, E.D.	African Security	2021	10.1080/19392206.2021.1955496	4	"Through a qualitative approach, this study examines the performance of existing ranches in addressing farmer-herder conflicts and the feasibility of ranches under complex land tenure arrangements."
1	Climate Change and Water Dynamics in Rural Uganda	McKinney, L.; Wright, D.C.	Sustainability	2021	10.3390/su13158322	4	"The purpose of this case study is to examine the effects of climate change on agricultural life in rural Uganda."
1	An integrated approach for the identification and prioritization of areas based on their livelihood vulnerability index: a case study of agro-pastoral community from Western Indian Himalaya	Joshi, N.C.; Rawat, G.S.	Mitigation and Adaptation Strategies for Global Change	2021	10.1007/s11027-021-09962-5	4	"This study aims to evaluate the livelihood vulnerability of an agro-pastoral community viz to hunger and malnutrition due to impacts of changes in climatic conditions over subsistence practices"
1	A low-cost toolbox for high-resolution vulnerability and hazard-perception mapping in view of tsunami risk mitigation: Application to New Caledonia	Thomas, B.E.O.; Roger, J.; Gunnell, Y.; Sabinot, C.; Aucan, J.	International Journal of Disaster Risk Reduction	2021	10.1016/j.ijdrr.2021.102350	4	"This paper presents a mixed methodology built on GIS-based dasymetric techniques for assessing, classifying, and mapping population distribution in New Caledonia, with the aim of quantifying and ranking the areas most vulnerable to tsunami-related hazards.
1	Landslide mitigation strategies in southeast Bangladesh: Lessons learned from the institutional responses	Sultana, N.; Tan, S.K.	International Journal of Disaster Risk Reduction	2021	10.1016/j.ijdrr.2021.102402	4	"The paper examines how local-level institutions mitigate landslide hazards in southeast Bangladesh."
1	Data Construction and Spatiotemporal Trend Attribution of Runoff over the African Continent (1981-2016)	Karamage, F.; Liu, Y.B.; Liu, Y.W.	Journal of Hydrometeorology	2021	10.1175/JHM-D-20-0143.1	4	This study aimed to improve runoff estimates and to assess runoff trend responses to climate change and human activities in Africa during 1981-2016"
1	Post-wildfire rebuilding and new development in California indicates minimal adaptation to fire risk	Kramer, H.A.; Butsic, V.; Mockrin, M.H.; Ramirez-Reyes, C.; Alexandre, P.M.; Radeloff, V.C.	Land Use Policy	2021	10.1016/j.lusepol.2021.105502	4	"We examined 28 of the most destructive wildfires in California, the state where most buildings are destroyed by wildfires, to evaluate whether locations of rebuilt and newly constructed buildings were adaptive (i.e., if building occurred in lower risk areas)."
1	Effects of past landscape changes on aesthetic landscape values in the European Alps	Schirpke, U.; Zoderer, B.M.; Tappeiner, U.; Tasser, E.	Landscape and Urban Planning	2021	10.1016/j.lurbplan.2021.104109	4	"This study aims at analysing changes in aesthetic landscape values for three time steps between 1950 and 2010 across the European Alps."
1	Geographical indication agricultural products, livelihood capital, and resilience to meteorological disasters: evidence from kiwifruit farmers in China	Qin, Y.H.; Shi, X.M.; Li, X.P.; Yan, J.W.	Environmental Science and Pollution Research	2021	10.1007/s11356-021-15547-1	4	"Based on the field survey data of Shaanxi Province, this research uses the method of natural breaks to classify the resilience scores of meteorological disasters under the framework of Sustainable Livelihoods Approach."
1	Developing a paradigm model for the analysis of farmers' adaptation to water scarcity	Zobeidi, T.; Yaghoubi, J.; Yazdanpanah, M.	Environment Development and Sustainability	2021	10.1007/s10668-021-01663-y	4	"This study, using a qualitative approach, investigated the methods of water scarcity adaptation by farmers in Khuzestan Province in southwestern Iran and the farmers' adaptation process using a paradigmatic model."
1	The impact of climate change on the economic perspectives of crop farming in Pakistan: Using the ricardian model	Ali, U.; Wang, J.; Ullah, A.; Ishtiaque, A.; Javed, T.; Nurgazina, Z.	Journal of Cleaner Production	2021	10.1016/j.jclepro.2021.127219	4	"Considering Khyber Pakhtunkhwa (KP) province of Pakistan as the study area, we attempted to fill this gap by analyzing the economic impacts of climate change on the net income from crop farming."
1	Climate change adaptation in fisheries	Galappaththi, E.K.; Susarla, V.B.; Loutet, S.J.T.; Ichien, S.T.; Hyman, A.A.; Ford, J.D.	Fish and Fisheries	2021	10.1111/faf.12595	8	It's a global systematic literature review of cliamte change adaptation in fisheries.
1	Gender differences in farmers' livelihood capital in Dazu District, China	Kuang, F.Y.; Jin, J.J.; Zhang, C.Y.; He, R.; Qiu, X.; Guan, T.; Li, L.	Journal of Environmental Planning and Management	2021	10.1080/09640568.2021.1957798	4	"This study aims to investigate whether there are gender differences in the livelihood capital of farming households in China."
1	Role of Social Network Measurements in Improving Adaptive Capacity: The Case of Agricultural Water Users in Rural Areas of Western Iran	Afkhami, M.; Ghorbani, M.; Zahraie, B.; Azadi, H.	Society & Natural Resources	2021	10.1080/08941920.2021.1953201	4	"This study aims at exploring ways of increasing adaptive capacity and reducing vulnerability of farmers in the face of water scarcity through establishing a link between social network indicators and the dimensions of adaptive capacity."
1	The potential of dairy manure and sewage management pathways towards a circular economy: A meta-analysis from the life cycle perspective	Zhang, J.N.; Wang, M.M.; Yin, C.B.; Dogot, T.	Science of the Total Environment	2021	10.1016/j.scitotenv.2021.146396	4	"This meta-analysis presented comparative results of publicly available dairy MSM pathways, including waste-to-energy, composting, recycling, and other management pathways, aiming to explore potential benefits towards a circular economy."
1	On-farm adaptation strategies to climate change: the case of smallholder farmers in the Northern Development Authority Zone of Ghana	Asravor, R.K.	Environment Development and Sustainability	2021	10.1007/s10668-021-01650-3	4	This paper examines the barriers and adaptation strategies of smallholder farmers in the Northern Development Authority (NDR) zone of Ghana to climate change. The study also investigates the effect of the socio-economic and institutional factors on the on-farm adaptation strategies to climate change of smallholder farmers.

1	A global dataset of inland fisheries expert knowledge	Stokes, G.L.; Lynch, A.J.; Funge-Smith, S.; Valbo-Jorgensen, J.; Beard, T.D.; Lowe, B.S.; Wong, J.P.; Smidt, S.J.	Scientific Data	2021	10.1038/s41597-021-00949-0	3	"This paper introduces a dataset summarizing the expert-perceived state of inland fisheries at the basin (fishery) level."
1	Non-climatic stressors constraining adaptation to drought in rice-farming communities in the Philippines	Manalo, J.A.; van de Fliert, E.; Fielding, K.	Climate and Development	2021	10.1080/17565529.2021.1949571	4	"In the current study, we conducted interviews with farmers in drought-prone rice-producing provinces in the Philippines to better understand the types of stressors they face in adapting to climate change."
1	Vulnerability analysis of Nigeria's agricultural output growth and climate change	Adeosun, O.T.; Asare-Nuamah, P.; Mabe, F.N.	Management of Environmental Quality	2021	10.1108/MEQ-04-2021-0075	4	"This study gives due consideration to the impact of climate change on agricultural output between the years 1986 and 2015."
1	Traditional communities, territories and climate change in the literature - case studies and the role of law	Iocca, L.; Fidelis, T.	Climate and Development	2021	10.1080/17565529.2021.1949573	8	It's a review on how the literature is studying the importance of law to protect traditional communities and respective territories and integrate their knowledge in climate change adaptation mechanisms.
1	Not All Those Who Wander Are Lost - Responses of Fishers Communities to Shifts in the Distribution and Abundance of Fish '	Papaioannou, E.A.; Selden, R.L.; Olson, J.; McCay, B.J.; Pinsky, M.L.; Martin, K.S.	Frontiers in Marine Science	2021	10.3389/fmars.2021.669094	4	"We examined how fishing communities in the Northeast United States -a hotspot of recent warming-have already responded to documented shifts in the distribution and abundance of fluke, red and silver hake."
1	Impacts of climate change and adaptations in shrimp aquaculture: A study in coastal Andhra Pradesh, India	Muralidhar, M.; Kumaran, M.; Jayanthi, M.; Dayal, J.S.; Kumar, J.A.; Saraswathy, R.; Nagavel, A.	Aquatic Ecosystem Health & Management	2021	10.14321/aehm.024.03.05	3	The perceptions of farmers on the impacts of climate change on shrimp aquaculture in inland and coastal areas of Krishna District, Andhra Pradesh are discussed.
1	Ecosystem vulnerability of floodplain wetlands of the Lower Brahmaputra Valley to climatic and anthropogenic factors	Debnath, D.; Bhattacharjya, B.K.; Yengkokpam, S.; Sarkar, U.K.; Paul, P.; Das, B.K.	Aquatic Ecosystem Health & Management	2021	10.14321/aehm.024.03.08	4	"This study assessed the vulnerability of 16 floodplain wetlands (beels) of the Lower Brahmaputra Valley, Assam, India, in relation to a range of natural and anthropogenic factors including climate change."
1	Vineyard-specific climate projections help growers manage risk and plan adaptation in the Paso Robles AVA	Babin, N.; Guerrero, J.; Rivera, D.; Singh, A.	California Agriculture	2021	10.3733/ca.2021a0019	4	"As part of this study, we developed a method for transforming downscaled climate information from the publicly available Cal-Adapt database into useful and useable climate projections for vineyard managers and advisors in the Paso Robles American Viticultural Area."
1	Exploring community and key stakeholders' perception of scientific tourism as a strategy to achieve SDGs in the Ecuadorian Amazon	Izurieta, G.; Torres, A.; Patino, J.; Vasco, C.; Vasseur, L.; Reyes, H.; Torres, B.	Tourism Management Perspectives	2021	10.1016/j.tmp.2021.100830	4	"This research examines the perception regarding scientific tourism (ScT) and its contribution to the UN Sustainable Development Goals (SDGs)."
1	Walking with farmers: Floods, agriculture and the social practice of everyday mobility	Arnall, A.	Global Environmental Change-Human and Policy Dimensions	2021	10.1016/j.gloenvcha.2021.102289	4	Using an innovative walking methodology, it presents an empirical case study of regularised farmers' movements in and out of a floodplain during the rainy season in central Mozambique to show how people's day-to-day routes are continuously reproduced through meaningful encounters and engagements with physical obstacles and other people. The paper demonstrates how a concern with everyday mobility highlights people's day-to-day capacities to respond to environmental variability and change while also drawing attention to the challenges associated with the gradual accumulation of risk in mobile, rural livelihoods.
1	Understanding Drivers of Unsustainable Natural Resource Use in the Comoro Islands	Ibouroi, M.T.; Dhurham, S.A.O.; Besnard, A.; Lescureux, N.	Tropical Conservation Science	2021	10.1177/1940082921103258 5	4	"To better understand the relationships between humans and nature; how comorian people use natural resource and the relevance of a protected area for long-term biodiversity conservation, we used Q-methodology to assess local people's perceptions regarding biodiversity and conservation actions."
1	Assessment of a Ground-Based Lightning Detection and Near-Real-Time Warning System in the Rural Community of Swayimane, KwaZulu-Natal, South Africa	Mahomed, M.; Clulow, A.D.; Strydom, S.; Mabhaudhi, T.; Savage, M.J.	Weather Climate and Society	2021	10.1175/WCAS-D-20-0116.1	4	"We therefore developed a community-based early warning system (EWS) to detect and disseminate lightning threats and alerts in a timely and comprehensible manner within Swayimane, KwaZulu-Natal, South Africa."
1	Contribution of Climate-Smart Agriculture Technologies to Food Self-Sufficiency of Smallholder Households in Mali	Traore, B.; Birhanu, B.Z.; Sangare, S.; Gumma, M.K.; Tabo, R.; Whitbread, A.M.	Sustainability	2021	10.3390/su13147757	4	"In this paper, we present a methodology for scaling climate-smart agriculture (CSA) technologies such as Contour Bunding (CB), Microdosing (MD), Intercropping (IC), Zai pits, and Adapted crop Variety (AV) treatments, and evaluated their contribution to smallholder households' food self-sufficiency."
1	Bills of Fare, Consumer Demand, Social Status, Ethnicity, and the Collapse of California Abalone	Braje, T.J.; Bentz, L.	Journal of Ethnobiology	2021		4	"Here, we turn our attention to consumption issues and explore how market-forces, status, ethnicity, and evolving perceptions of food can drive fisheries collapse."
1	Interconnected governance and social barriers impeding the restoration process of Lake Urmia	Pouladi, P.; Badiezadeh, S.; Pouladi, M.; Yousefi, P.; Farahmand, H.; Kalantari, Z.; Yu, D.J.; Sivapalan, M.	Journal of Hydrology	2021	10.1016/j.jhydrol.2021.126489	4	"This study, therefore, focuses on identifying and teasing out how various socio-hydrological factors influence the anthropogenic drought and water governance efforts using the case of Lake Urmia."
1	An attributional life cycle assessment of microbial protein production: A case study on using hydrogen-oxidizing bacteria	Jarvio, N.; Maljanen, N.L.; Kobayashi, Y.; Ryynanen, T.; Tuomisto, H.L.	Science of The Total Environment	2021	10.1016/j.scitotenv.2021.145764	4	"This study assessed the environmental impacts of microbial protein (MP) produced by autotrophic hydrogen-oxidizing bacteria (HOB)."
1	Future export markets of industrial wood construction-A qualitative backcasting study	Toivonen, R.; Lilja, A.; Vihemaki, H.; Toppinen, A.	Forest Policy and Economics	2021	10.1016/j.forpol.2021.102480	4	"The analysis in this study concerns the preferred future export markets for industrial wood construction for the Finnish wood construction industry, as viewed by a panel of industrial, policy and academic experts."
1	Systematic Conservation Planning at an Ocean Basin Scale: Identifying a Viable Network of Deep-Sea Protected Areas in the North Atlantic and the Mediterranean	Combes, M.; Vaz, S.; Grehan, A.; Morato, T.; Arnaud-Haond, S.; Dominguez-Carrio, C.; Fox, A.; Gonzalez-Irusta, J.M.; Johnson, D.; Callery, O.; Davies, A.; Fauconnet, L.; Kenchington, E.; Orejas, C.; Roberts, J.M.; Taranto, G.; Menot, L.	Frontiers in Marine Science	2021	10.3389/fmars.2021.611358	4	"This study aims to structure and evaluate a framework for SCP applicable to the deep sea, focusing on the identification of conservation priority networks for vulnerable marine ecosystems (VMEs), such as cold-water coral reefs, sponge grounds, or hydrothermal vents, and for key demersal fish species."

1	The complementarity and determinants of adoption of climate change adaptation strategies: evidence from smallholder farmers in Northwest Ethiopia	Adego, T.; Woldie, G.A.	Climate and Development	2021	10.1080/17565529.2021.1943296	4	"This study aimed at investigating the factors that determine adaptation choices using multivariate and ordered econometric models." Don't evaluates perception of climate change.
1	Effect of a Seasonal Fishery Closure on Sardine and Mackerel Catch in the Visayan Sea, Philippines	Bagsit, F.U.; Frimpong, E.; Asch, R.G.; Monteclaro, H.M.	Frontiers in Marine Science	2021	10.3389/fmars.2021.640772	4	"Using a difference-in-differences (DID) framework, we estimated the effect of SFC on the interannual and seasonal catch for sardine and mackerel. We expanded our analysis to other species not regulated under the SFC policy."
1	Psychological capital and climate change adaptation: Empirical evidence from smallholder farmers in South Africa	Chipfupa, U.; Tagwi, A.; Wale, E.	Jamba-Journal of Disaster Risk Studies	2021	10.4102/jamba.v13i1.1061	4	"Hence, this study is the first attempt to assess how psychological capital affects climate change adaptation amongst smallholder farmers."
1	Horticultural plant use as a so-far neglected pillar of ex situ conservation	Ismail, S.A.; Pouteau, R.; van Kleunen, M.; Maurel, N.; Kueffer, C.	Conservation Letters	2021	10.1111/conl.12825	4	"We demonstrate how native and nonnative plant taxa used as ornamentals in private and public urban green spaces can significantly strengthen plant conservation in time of extinctions by expanding the capacity for ex situ living collections and raising awareness among professional and private gardeners and plant collectors."
6	Weather, Values, Capacity and Concern: Toward a Social-Cognitive Model of Specialty Crop Farmers' Perceptions of Climate Change Risk	Han, G.; Schoolman, E.D.; Arbuckle, J.G.; Morton, L.W.	Environment and Behavior	2021	10.1177/00139165211026607	2	Specialty crop producers.
1	Exploring awareness and application of disaster risk management cycle (DRMC) from stakeholder's perspective	Basri, S.A.A.; Zakaria, S.A.S.; Majid, T.A.; Yusop, Z.	International Journal of Disaster Resilience in the Built Environment	2021	10.1108/IJDRBE-09-2020-0105	4	"This paper aims to determine the awareness of stakeholder on DRMC and to explore the application of DRMC from stakeholder's perspective." DRMC= Disaster Risk Management Cycle
1	A Decade of Incorporating Social Sciences in the Integrated Marine Biosphere Research Project (IMBeR) Much Done, Much to Do?	van Putten, I.; Kelly, R.; Cavanagh, R.D.; Murphy, E.J.; Breckwoldt, A.; Brodie, S.; Cvitanovic, C.; Dickey-Collas, M.; Maddison, L.; Melbourne-Thomas, J.; Arrizabalaga, H.; Azetsu-Scott, K.; Beckley, L.E.; Bellerby, R.; Constable, A.J.; Cowie, G.; Evans, K.; Glaser, M.; Hall, J.; Hobday, A.J.; Johnston, N.M.; Llopiz, J.K.; Mueter, F.; Muller-Karger, F.E.; Weng, K.C.; Wolf-Gladrow, D.; Xavier, J.C.	Frontiers in Marine Science	2021	10.3389/fmars.2021.662350	4	"The aim of this article is to understand the contribution of interdisciplinary global research networks to solving complex marine socio-ecological challenges."
1	Climate risk management practices of fish and shrimp farmers in the Mekong Region	Lebel, L.; Jutagate, T.; Phuong, N.T.; Akester, M.J.; Rangsiwiwat, A.; Lebel, P.; Phousavanh, P.; Navy, H.; Soe, K.M.; Lebel, B.	Aquaculture Economics & Management	2021	10.1080/13657305.2021.1917727	2	Commercial aquaculture farmers.
1	Analysis of the Gulf of California cannonball jellyfish fishery as a complex system	Esther, C.C.M.; Angel, C.M.M.; Gabriela, M.M.; Ileana, E.; Miguel, C.M.A.; Luis, M.C.	Ocean & Coastal Management	2021	10.1016/j.ocecoaman.2021.105610	4	"Based on an analysis of stakeholder perceptions and its comparison with available quantitative data, this study provides a holistic view of the fishery and its actors as part of a complex adaptive system."
1	Explaining farmers' response to water crisis through theory of the norm activation model: Evidence from Iran	Savari, M.; Abdeshahi, A.; Gharechaee, H.; Nasrollahian, O.	International Journal of Disaster Risk Reduction	2021	10.1016/j.ijdrr.2021.102284	4	"Therefore, the main objective of this study was investigating determinants of water conservation behavior among farmers."
1	Enhancing physical geography schools outreach: Insights from co-production and storytelling narratives	Adamson, K.; Lane, T.; De Meyer, K.; Carney, M.; Oppenheim, L.; Panitz, S.; Price, H.; Smith, E.; Watson, G.	Progress in Physical Geography-Earth and Environment	2021	10.1177/03091333211017698	3	The survey was applied to schoolchildren.
1	The gateway bug to edible insect consumption: interactions between message framing, celebrity endorsement and online social support	Legendre, T.S.; Baker, M.A.	International Journal of Contemporary Hospitality Management	2021	10.1108/IJCHM-08-2020-0855	4	"Thus, this study aims to find ways to increase consumer acceptance of edible insects."
1	Role of local communities in forest landscape restoration: Key lessons from the Billion Trees Afforestation Project, Pakistan	Ullah, A.; Sam, A.S.; Sathyan, A.R.; Mahmood, N.; Zeb, A.; Kachele, H.	Science of the Total Environment	2021	10.1016/j.scitotenv.2021.145613	4	"This study identifies the factors that influenced rural household participation in the BTAP in Pakistan." BTAP= Billion Trees Afforestation Project
1	We don't use the same ways to treat the illness:' A qualitative study of heterogeneity in health-seeking behaviour for acute gastrointestinal illness among the Ugandan Batwa	Brubacher, L.J.; Berrang-Ford, L.; Clark, S.; Patterson, K.; Lwasa, S.; Namanya, D.B.; Twesigomwe, S.; Harper, S.L.	Global Public Health	2021	10.1080/17441692.2021.1937273	4	"This exploratory study investigated why Batwa choose Indigenous or biomedical treatment, or no treatment, when experiencing acute gastrointestinal illness."
1	Developing Climate Information Services for Aquaculture in Bangladesh: A Decision Framework for Managing Temperature and Rainfall Variability-Induced Risks	Hossain, P.R.; Amjath-Babu, T.S.; Krupnik, T.J.; Braun, M.; Mohammed, E.Y.; Phillips, M.	Frontiers in Sustainable Food Systems	2021	10.3389/fsufs.2021.677069	4	"This study aims to generate the background knowledge for developing climate information and decision support services tailored for aquaculture farmers in Bangladesh."
1	Smallholder farmer resilience to water scarcity	Aguilar, F.X.; Hendrawan, D.; Cai, Z.; Roshetko, J.M.; Stallmann, J.	Environment Development and Sustainability	2021	10.1007/s10668-021-01545-3	4	"We studied the association between rural livelihood capitals (natural, human, social, financial, and physical) and resilience to water scarcity."

1	Estimated footprint of shellfishing activities in Zostera noltei meadows in a northern Spain estuary: Lessons for management	Garmendia, J.M.; Valle, M.; Borja, A.; Chust, G.; Rodriguez, J.G.; Franco, J.	Estuarine Coastal and Shelf Science	2021	10.1016/j.ecss.2021.107320	4	"Here, the Oka estuary (Basque Country, N. Spain) is used as a case study to analyse the spatial extent of shellfishing activities in seagrass (Zostera noltei)."
1	Climate Change Adaptation and Mitigation in the Face of Local Uncertainty: A Phenomenological Study	Horne, L.; De Urioste-Stone, S.; Daigle, J.	Northeastern Naturalist	2021	10.1656/045.028.s1107	3	The abstract doesn't mention if there is any small-scale population among the stakeholders interviewed.
1	In the Era of Climate Change: Moving Beyond Conventional Agriculture in Thailand	Lee, S.	Asian Journal of Agriculture and Development	2021	10.37801/ajad2021.18.1.1	4	"This study reviews policies related to the development of organic agriculture in Thailand and examines whether organic agriculture is an effective adaptation and mitigation strategy to climate change that can also generate enough food."
1	Livelihood Adaptation of Rural Households under Livelihood Stress: Evidence from Sichuan Province, China	Yang, X.; Guo, S.L.; Deng, X.; Xu, D.D.	Agriculture-Basel	2021	10.3390/agriculture11060506	4	"Based on the survey data of 327 rural households in the Wenchuan and Lushan earthquake-stricken areas in the Sichuan Province, the livelihood pressure, adaptability, and livelihood strategy characteristics of rural households were analyzed, and the disordered multi-classification logistic regression model was constructed to explore the correlation between the above-mentioned variables."
1	A novel framework for marine protected areas in small island regions using integrated local wisdom	Hamid, S.K.; Teniwut, W.A.; Renhoran, M.; Teniwut, R.M.K.	Regional Studies in Marine Science	2021	10.1016/j.rsma.2021.101819	4	"we demonstrate a novel method for determining MPAs in the Kei Islands using local wisdom and marine supply-side approaches." MPAs= Marine Protected Areas
1	Socio-Ecological Perceptions of Wildfire Management and Effects in Greece	Palaiologou, P.; Kalabokidis, K.; Troumbis, A.; Day, M.A.; Nielsen-Pincus, M.; Ager, A.A.	Fire-Switzerland	2021	10.3390/fire4020018	4	It addresses stakeholders perceptions of wildfire management and its effects in Greece.
1	Local Perceptions on the Impact of Drought on Wetland Ecosystem Services and Associated Household Livelihood Benefits: The Case of the Driefontein Ramsar Site in Zimbabwe	Marambanyika, T.; Mupfiga, U.N.; Musasa, T.; Ngwenya, K.	Land	2021	10.3390/land10060587	4	"The paper assesses local people's perceptions on the impact of drought on wetland ecosystem services and the associated household livelihood benefits, focusing on the Driefontein Ramsar site in Chirumanzu district, Zimbabwe."
1	Learning in the Anthropocene	Karlsson, R.	Social Sciences-Basel	2021	10.3390/socsci10060233	4	"This paper explores the problem of finding indicators suitable for measuring progress towards meaningful climate action and the restoration of an ecologically vibrant planet."
1	The thorny path toward greening: unintended consequences, trade-offs, and constraints in green and blue infrastructure planning, implementation, and management	Kronenberg, J.; Andersson, E.; Barton, D.N.; Borgstrom, S.T.; Langemeyer, J.; Bjorklund, T.; Haase, D.; Kennedy, C.; Koprowska, K.; Laszkiewicz, E.; McPhearson, T.; Stange, E.E.; Wolff, M.	Ecology and Society	2021	10.5751/ES-12445-260236	6	"We analyze investment and planning initiatives in six case-study cities related to green and blue infrastructure (GBI) through the lens of a predefined set of questions an analytical framework based on the assumption that the flows of benefits from GBI to urban inhabitants and other stakeholders are mediated by three filters: infrastructures, institutions, and perceptions."
1	Is It Scientific? Viewer Perceptions of Storm Surge Visualizations	Stempel, P.J.; Becker, A.	Cartographica	2021	10.3138/cart-2020-0004	4	"This study explores how audiences regard these visualizations in relation to perceived representational norms for scientific graphics and visualizations."
1	A comparison of farm labour, profitability, and carbon footprint of different management strategies in Northern European grassland sheep systems	Morgan-Davies, C.; Kyle, J.; Boman, I.A.; Wishart, H.; McLaren, A.; Fair, S.; Creighton, P.	Agricultural Systems	2021	10.1016/j.agsy.2021.103155	4	"This trans-European study investigates the impact of differing sheep management strategies on farm labour input, carbon footprint as well as the on-farm profitability, to address these concerns."
1	Ecosystem services from (pre-) Alpine grasslands: Matches and mismatches between citizens' perceived suitability and farmers' management considerations	Schmitt, T.M.; Martin-Lopez, B.; Kaim, A.; Fruh-Muller, A.; Koellner, T.	Ecosystem Services	2021	10.1016/j.ecoser.2021.101284	4	"In this study, we examined the perceptions of farmers and citizens regarding grassland ecosystem services, specifically the matches and mismatches between perceived suitability of grasslands and importance assigned by farmers in their management considerations."
1	Evaluating Three-Pillar Sustainability Modelling Approaches for Dairy Cattle Production Systems	de Otalora, X.D.; del Prado, A.; Dragoni, F.; Estelles, F.; Amon, B.	Sustainability	2021	10.3390/su13116332	4	"In this study, integrated sustainability assessment by means of whole-farm modelling is presented as a valuable approach for identifying factors and mechanisms that could be used to improve the three pillars (3Ps) of sustainability in the context of an increasing awareness of economic profitability, social well-being, and environmental impacts of dairy production systems (DPS)."
1	Reimagining climate-informed development: From matters of fact to matters of care	Tozzi, A.	Geographical Journal	2021	10.1111/geoj.12390	4	It's a critical review on success and failures of climate-informed development practices.
1	Lake Users' Perceptions of Environmental Change: Ecosystem Services and Disservices Associated with Aquatic Plants	Wood, L.E.; Andriamahefazafy, M.Z.; Guilder, J.; Kull, C.A.; Shackleton, R.T.	Water	2021	10.3390/w13111459	4	"In this study, questionnaires and key informant interviews were used to assess lake users' perceptions of broad scale environmental change in the lake paying special attention tochanges in the abundance of aquatic plants and the perceived ecosystem services (ES) and ecosystem disservices (EDS) associated with them."
1	Ambient Air Pollution: Health Hazards to Children	Brumberg, H.L.; Karr, C.J.	Pediatrics	2021	10.1542/peds.2021-051484	4	"This policy reviews both short- and long-term health consequences of ambient air pollution, especially in relation to developmental exposures. It examines individual, community, and legislative strategies to mitigate air pollution."
1	Participatory video for two-way communication in research for development	Koningstein, M.; Azadegan, S.	Action Research	2021	10.1177/1476750318762032	4	"This paper presents the participatory video methodology as an effective tool to establish a two-way communication channel between researchers and marginalized communities."
1	Bhalia wheat in Gujarat: Does geographical indication registration have a role in arresting the decline?	Lalitha, N.; Bandi, M.; Vinayan, S.	Journal of Social and Economic Development	2021	10.1007/s40847-020-00137-7	4	"Drawn from a larger study on geographical indications (GI) in agricultural sector in India, this study found that soil conservation and land preparation practices are rich in traditional knowledge, involve social cohesion and provide employment."
1	Barriers to climate change adaptation: Qualitative evidence from southwestern Iran	Chenani, E.; Yazdanpanah, M.; Baradaran, M.; Azizi-Khalkheili, T.; Najafabadi, M.M.	Journal of Arid Environments	2021	10.1016/j.jaridenv.2021.104487	4	This study identifies and explores barriers to climate change adaptation in the Susa county, a historic region of Khuzestan Province in southwestern Iran.
1	Scientific research on ecosystem services and human well-being: A bibliometric analysis	Wang, B.J.; Zhang, Q.; Cui, F.Q.	Ecological Indicators	2021	10.1016/j.ecolind.2021.107449	4	"Here, we explored the scientific literature on ecosystem services and human well-being at a global scale to investigate the temporal development, scientific collaboration, research hotspots and emerging trends over the last 27 years (1992?2018) using CiteSpace."

1	Positive Social-Ecological Feedbacks in Community-Based Conservation	Quintana, A.C.E.; Giron-Nava, A.; Urmy, S.; Cramer, A.N.; Dominguez-Sanchez, S.; Rodriguez-Van Dyck, S.; Aburto-Oropeza, O.; Basurto, X.; Weaver, A.H.	Frontiers in Marine Science	2021	10.3389/fmars.2021.652318	4	"In this paper, we theoretically and empirically explore a model of short-term area-based conservation that prioritizes adaptive co-management: temporary areas closed to fishing, designed by the fishers they affect, approved by the government, and adapted every 5 years."
6	Perceived impacts of climate change on rural poultry production: a case study in Limpopo Province, South Africa	Nyoni, N.M.B.; Grab, S.; Archer, E.; Hetem, R.	Climate and Development	2021	10.1080/17565529.2021.1929803	6	Location: town of Musina, South Africa.
1	Drinking water salinity is associated with hypertension and hyperdilute urine among Daasanach pastoralists in Northern Kenya	Rosinger, A.Y.; Bethancourt, H.; Swanson, Z.S.; Nzunza, R.; Saunders, J.; Dhanasekar, S.; Kenney, W.L.; Hu, K.B.; Douglass, M.J.; Ndiema, E.; Braun, D.R.; Pontzer, H.	Science of the Total Environment	2021	10.1016/j.scitotenv.2020.144667	4	"Therefore, this cross-sectional study conducted water quality analyses to examine how water salinity, along with lifestyle factors like milk intake, was associated with hypertension (blood pressure BP >= 140 mm Hg systolic or >= 90 mm Hg diastolic) and hyperdilute urine (urine specific gravity <1.003 g/mL, indicative of altered kidney function)."
1	Climate risks and adaptation strategies of farmers in East Africa and South Asia	Aryal, J.P.; Sapkota, T.B.; Rahut, D.B.; Marenya, P.; Stirling, C.M.	Scientific Reports	2021	10.1038/s41598-021-89391-1	4	"this study investigates the main climate risks that farmers faced and the adaptation strategies they used." Their perception about climate change weren't evaluated
1	Farmers' knowledge, perceptions, and farm-level management practices of citrus pests and diseases in Morocco	Lahlali, R.; Jaouad, M.; Moinina, A.; Mokrini, F.; Belabess, Z.	Journal of Plant Diseases and Protection	2021	10.1007/s41348-021-00479-2	2	Monoculture citrus producers.
1	Representativeness of Eddy-Covariance flux footprints for areas surrounding AmeriFlux sites	Chu, H.S; Luo, X.Z.; Ouyang, Z.T.; Chan, W.S.; Dengel, S.; Biraud, S.C.; Torn, M.S.; Metzger, S.; Kumar, J.; Arain, M.A.; Arkebauer, T.J.; Baldocchi, D.; Bernacchi, C.; Billesbach, D.; Black, T.A.; Blanken, P.D.; Bohrer, G.; Bracho, R.; Brown, S.; Brunsell, N.A.; Chen, J.Q.; Chen, X.Y.; Clark, K.; Desai, A.R.; Duman, T.; Durden, D.; Fares, S.; Forbrich, I.; Gamon, J.A.; Gough, C.M.; Griffis, T.; Helbig, M.; Hollinger, D.; Humphreys, E.; Ikawa, H.; Iwata, H.; Ju, Y.; Knowles, J.F.; Knox, S.H.; Kobayashi, H.; Kolb, T.; Law, B.; Lee, X.H.; Litvak, M.; Liu, H.P.; Munger, J.W.; Noormets, A.; Novick, K.; Oberbauer, S.F.; Oechel, W.; Oikawa, P.; Papuga, S.A.; Pendall, E.; Prajapati, P.; Prueger, J.; Quinton, W.L.; Richardson, A.D.; Russell, E.S.; Scott, R.L.; Starr, G.; Staebler, R.; Stoy, P.C.; Stuart-Haentjens, E.; Sonnentag, O.; Sullivan, R.C.; Suyker, A.; Ueyama, M.; Vargas, R.; Wood, J.D.; Zona, D.	Agricultural and Forest Meteorology	2021	10.1016/j.agrformet.2021.108350	4	This study aims to answer to what spatial extent do flux measurements taken at individual eddy-covariance sites reflect model- or satellite-based grid cells.
7	Blue justice: A survey for eliciting perceptions of environmental justice among coastal planners' and small-scale fishers in Northern-Norway	Engen, S.; Hausner, V.H.; Gurney, G.G.; Broderstad, E.G.; Keller, R.; Lundberg, A.K.; Murguzur, F.J.A.; Salminen, E.; Raymond, C.M.; Falk-Andersson, J.; Fauchald, P.	Plos One	2021	10.1371/journal.pone.0251467	4	It explores fishers' perceptions on blue economy in coastal areas.
1	Alternative futures for global biological invasions	Roura-Pascual, N.; Leung, B.; Rabitsch, W.; Rutting, L.; Vervoort, J.; Bacher, S.; Dullinger, S.; Erb, K.H.; Jeschke, J.M.; Katsanevakis, S.; Kuhn, I.; Lenzner, B.; Liebhold, A.M.; Obersteiner, M.; Pauchard, A.; Peterson, G.D.; Roy, H.E.; Seebens, H.; Winter, M.; Burgman, M.A.; Genovesi, P.; Hulme, P.E.; Keller, R.P.; Latombe, G.; McGeoch, M.A.; Ruiz, G.M.; Scalera, R.; Springborn, M.R.; von Holle, B.; Essl, F.	Sustainability Science	2021	10.1007/s11625-021-00963-6	4	"Here, we use a novel participatory process to develop a diverse set of global biological invasion scenarios spanning a wide range of plausible global futures through to 2050."
6	Comparing the environmental performance of distributed versus centralized plastic recycling systems: Applying hybrid simulation modeling to life cycle assessment	Kerdlap, P.; Purnama, A.R.; Low, J.S.C.; Tan, D.Z.L.; Barlow, C.Y.; Ramakrishna, S.	Journal of Industrial Ecology	2021	10.1111/jiec.13151	4	"To holistically quantify the environmental performance of this type of system, a life cycle assessment (LCA) is conducted to compare five different scenarios of distributed and centralized sorting and recycling of plastic bottles and takeaway containers in Singapore."
1	The response of culturally important plants to experimental warming and clipping in Pakistan Himalayas	Karimi, S.; Nawaz, M.A.; Naseem, S.; Akrem, A.; Ali, H.; Dangles, O.; Ali, Z.	Plos One	2021	10.1371/journal.pone.0237893	4	"we combined the indigenous knowledge about culturally important therapeutic plants and climate change with experimental warming (open-top chambers) and manual clipping (simulated grazing effect) and compared the relative difference on aboveground biomass and percent cover of plant species at five alpine meadow sites on an elevation gradient (4696 m-3346 m) from 2016-2018."

1	Time discounting and implications for Chinese farmer responses to an upward trend in precipitation	Ding, Y.H.; Balcombe, K.; Robinson, E.	Journal of Agricultural Economics	2021	10.1111/1477-9552.12434	4	"This paper studies Chinese grape growers' time discounting and its implications for the adoption of technology that can reduce the negative effects of increasing precipitation."
1	The role of climate change adaptation of small-scale farmers on the households food security level in the west of Iran	Savari, M.; Zhoolideh, M.	Development in Practice	2021	10.1080/09614524.2021.1911943	4	"the present study was conducted to analyse the role of adaptation capability of small-scale farmers against climate change on the households' food security level in the west of Iran."
1	Latitudinal influence on gametogenesis and host-parasite ecology in a marine bivalve model	Mahony, K.E.; Lynch, S.A.; Egerton, S.; Laffan, R.E.; Correia, S.; de Montaudouin, X.; Mesmer-Dudons, N.; Freitas, R.; Culloty, S.C.	Ecology and Evolution	2021	10.1002/ece3.7551	4	"This study aimed to investigate the associative effects of host reproduction and a host-parasite interplay on a marine bivalve, along a geographic gradient of latitude."
1	Sustainable Crop Production, the Concurrent Adoption of Contract Farming, and Managing Risks through Income Diversification	Akhtar, S.; Abbas, A.; Kassem, H.S.; Bagadeem, S.; Ullah, R.; Alotaibi, B.A.	Agronomy-Basel	2021	10.3390/agronomy11050973	2	Hybrid maize farmers.
1	Barriers and Opportunities for the Implementation of Sustainable Farming Practices in Mediterranean Tree Orchards	Calatrava, J.; Martinez-Granados, D.; Zornoza, R.; Gonzalez-Rosado, M.; Lozano-Garcia, B.; Vega-Zamora, M.; Gomez-Lopez, M.D.	Agronomy-Basel	2021	10.3390/agronomy11050821	4	"This study identifies, through consultation with relevant stakeholders, low-input farming practices that can help to minimize the most pressing agronomic and environmental problems in some of the most relevant Mediterranean woody crops in Spain (almond, citrus, and olive) and enhance their sustainability."
1	Resilience of French organic dairy cattle farms and supply chains to the Covid-19 pandemic	Perrin, A.; Martin, G.	Agricultural Systems	2021	10.1016/j.agsy.2021.103082	4	"Our objectives were to report evidence for the resilience of French organic dairy cattle farms and supply chains to the Covid-19 pandemic and to discuss the features of those farms and supply chains that promoted resilience."
1	Local Communities' Willingness to Accept Compensation for Sustainable Ecosystem Management in Wadi Araba, South of Jordan	Al-Assaf, A.; Albalawneh, A.; Majdalawi, M.; Abu Nowar, L.; Kabariti, R.; Hjazin, A.; Aljaafreh, S.; Hammour, W.A.; Diab, M.; Haddad, N.	Sustainability	2021	10.3390/su13095190	4	"This study aimed to analyze the attitudes towards ES among households living in Wadi Araba, a study area located in a dry ecosystem with limited natural resources, as well as to determine the value of ES and the main socio-economic and perceptions factors influencing households' willingness to accept (WTA) compensation according to the families' priorities." ES= Ecosystem Services
1	Implementing forest landscape restoration in Latin America: Stakeholder perceptions on legal frameworks	Schweizer, D.; Meli, P.; Brancalion, P.H.S.; Guariguata, M.R.	Land Use Policy	2021	10.1016/j.lusepol.2019.104244	4	"In this paper, we examine the perceptions of different types of stakeholders from 17 Latin American countries on aspects of forestry and environmental legal frameworks that enable or hamper FLR interventions at the national level."
1	The role of perceptions, goals and characteristics of wine growers on irrigation adoption in the context of climate change	Graveline, N.; Gremont, M.	Agricultural Water Management	2021	10.1016/j.agwat.2021.106837	2	Wine growers in southeastern France.
1	Physiological and genetic characterization of heat stress effects in a common bean RIL population	Vargas, Y.; Mayor-Duran, V.M.; Buendia, H.F.; Ruiz-Guzman, H.; Raatz, B.	Plos One	2021	10.1371/journal.pone.0249859	4	"To study physiological responses and to characterize the genetics of heat stress tolerance, we evaluated the recombinant inbred line (RIL) population IJR (Indeterminate Jamaica Red) x AFR298 of the Andean gene pool."
1	Prospects, determinants and profitability of aquaculture insurance among fish farmers in the Eastern Region of Ghana	Mensah, N.O.; Amrago, E.C.; Mensah, E.T.D.; Asare, J.K.; Anang, S.A.	World Journal of Science Technology and Sustainable Development	2021	10.1108/WJSTSD-02-2021-0018	4	"the authors examine the prospects, determinants and profitability of aquaculture insurance among fish farmers in the Eastern region of Ghana."
1	Anthelmintic resistance in small ruminants in the Nordic-Baltic region	Belecke, A.; Kupcinskas, T.; Stadaliene, I.; Hoglund, J.; Thamsborg, S.M.; Stuen, S.; Petkevicius, S.	Acta Veterinaria Scandinavica	2021	10.1186/s13028-021-00583-1	4	"The aim of this paper is to provide an overview of the problem of AR on sheep and goat farms in the Nordic-Baltic region."
1	Transcriptomic and Physiological Analysis Reveal That alpha-Linolenic Acid Biosynthesis Responds to Early Chilling Tolerance in Pumpkin Rootstock Varieties	Liu, W.Q.; Zhang, R.Y.; Xiang, C.G.; Zhang, R.Y.; Wang, Q.; Wang, T.; Li, X.J.; Lu, X.H.; Gao, S.L.; Liu, Z.X.; Liu, M.S.; Gao, L.H.; Zhang, W.N.	Frontiers in Plant Science	2021	10.3389/fpls.2021.669565	4	"In our study, multi-disciplinary aspect approaches were used to investigate growth changes of pumpkin under chilling stress."
1	Wastewater reuse for livestock feed irrigation as a sustainable practice: A socio-environmental-economic review	Lahlou, F.Z.; Mackey, H.R.; Al-Ansari, T.	Journal of Cleaner Production	2021	10.1016/j.jclepro.2021.126331	4	"This review gathers all the studies that have investigated the reuse of wastewater in growing animal feed. It details the findings based on the social, environmental, and economic dimensions of sustainability."
1	Rangeland Ecosystem Service Markets: Panacea or Wicked Problem?	Roche, L.M.; Saitone, T.L.; Tate, K.W.	Frontiers in Sustainable Food Systems	2021	10.3389/fsufs.2021.554373	4	"we discuss the most significant impediments to development and function of non-bundled ecosystem service markets; on the supply side, we provide unique perspectives, using novel interview data from California rangeland cattle producers."
1	Barriers to ecological restoration in Europe: expert perspectives	Cortina-Segarra, J.; Garcia-Sanchez, I.; Grace, M.; Andres, P.; Baker, S.; Bullock, C.; Decleer, K.; Dicks, L.V.; Fisher, J.L.; Frouz, J.; Klimkowska, A.; Kyriazopoulos, A.P.; Moreno-Mateos, D.; Rodriguez-Gonzalez, P.M.; Sarkki, S.; Ventocilla, J.L.	Restoration Ecology	2021	10.1111/rec.13346	4	"We assessed European restoration experts' perceptions on barriers to restoration in Europe, and their relative importance, through a multiple expert consultation using a Delphi process"
1	Climate change adaptation and cocoa farm rehabilitation behaviour in Ahafo Ano North District of Ashanti region, Ghana	Oyekale, A.S.	Open Agriculture	2021	10.1515/opag-2020-0191	2	Cocoa monoculture producers
1	The role of national affluence, carbon emissions, and democracy in Europeans' climate perceptions	Pohjolainen, P.; Kukkonen, I.; Jokinen, P.; Poortinga, W.; Ogunbode, C.A.; Bohm, G.; Fisher, S.; Umit, R.	Innovation-The European Journal of Social Science Research	2021	10.1080/13511610.2021.1909465	3	The survey was applied to general european population.

1	Consciously eco- conscious: An eco-conscious re-reading of Bibhutibhushan Bandyopadhyay's Moon Mountain as young adult literature	Narendiran, S.; Bhuvaneswari, R.	Rupkatha Journal on Interdisciplinary Studies in Humanities	2021	10.21659/rupkatha.v13n2.25	4	"This article highlights the role of young adult narratives in spreading social awareness and interprets the classic Indian young adult novel Moon Mountain by Bibhutibhushan Bandyopadhyay, which has symbolic references offering ecological insights."
1	Co-flourishing: Intertwining community resilience and tourism development in destination communities	Wakil, M.A.; Sun, Y.; Chan, E.H.W.	Tourism Management Perspectives	2021	10.1016/j.tmp.2021.100803	4	"we propose a 'co-flourishing' framework integrating community resilience and tourism development by mobilising six types of community capital - human, social, natural, physical, financial, and psychological - which strengthen community capacity during disturbances or crises."
1	Grassroots farmers' perceptions on climate change and adaptation in arid region of Rajasthan	Singh, N.P.; Anand, B.; Srivastava, S.K.; Kumar, N.R.; Sharma, S.	Indian Journal of Traditional Knowledge	2021		6	Location: Bikaner district of Rajasthan is a city.
1	Conservation biology: four decades of problem- and solution-based research	Fonseca, C.R.; Paterno, G.B.; Guadagnin, D.L.; Venticinque, E.M.; Overbeck, G.E.; Ganade, G.; Metzger, J.P.; Kollmann, J.; Sauer, J.; Cardoso, M.Z.; Lopes, P.F.M.; Oliveira, R.S.; Pillar, V.D.; Weisser, W.W.	Perspectives in Ecology and Conservation	2021	10.1016/j.pecon.2021.03.003	4	"This review evaluates the relative effort of conservation biology in problem-based and solution-based research, and tests whether or not this has changed in the past decades for five major drivers of biodiversity loss, i.e. habitat loss and fragmentation, overexploitation, biological invasion, pollution, and climate change."
1	Community Perceptions and Pro-Environmental Behavior: The Mediating Roles of Social Norms and Climate Change Risk	Smith, C.J.; Dupre, K.E.; McEvoy, A.; Kenny, S.	Canadian Journal of Behavioural Science-Revue Canadienne Des Sciences Du Comportement	2021	10.1037/cbs0000229	3	The survey was applied to general Canadian citizens
1	Can We Use Machine Learning for Agricultural Land Suitability Assessment?	Moller, A.B.; Mulder, V.L.; Heuvelink, G.B.M.; Jacobsen, N.M.; Greve, M.H.	Agronomy-Basel	2021	10.3390/agronomy11040703	4	Through machine learning, this study tests the assumption that farmers grow their crops in the best-suited areas.
1	Projections of Local Knowledge-Based Adaptation Strategies of Mexican Coffee Farmers	Ruiz-Garcia, P.; Conde-Alvarez, C.; Gomez-Diaz, J.D.; Monterroso-Rivas, A.I.	Climate	2021	10.3390/cli9040060	4	"This paper provides an assessment of adaptation actions based on the local knowledge of coffee farmers in southern Mexico."
1	Industry Leaders' Perceptions of Residential Wood Pellet Technology Diffusion in the Northeastern US	Olechnowicz, C.; Leahy, J.; Guo, T.; Huff, E.S.; Danks, C.; Adams, M.	Sustainability	2021	10.3390/su13084178	4	This study assessed industry leaders' perceptions of innovation diffusion process of wood pellet residential heating technology.
1	Ocean imagery relates to an individual?s cognitions and pro-environmental behaviours	Engel, M.T.; Vaske, J.J.; Bath, A.J.	Journal of Environmental Psychology	2021	10.1016/j.jenvp.2021.101588	4	"This article deconstructs mental ocean imagery and explores how these images relate to one?s marine value orientations, personal norms, emotional involvement (fear), attitudes toward marine sustainable use of resources, acceptability for ocean use, and pro-environmental behaviours."
1	Fishing Industry Perspectives on Sea-Level Rise Risk and Adaptation	Stoltz, A.D.; Shivlani, M.; Glazer, R.	Water	2021	10.3390/w13081124	3	"this study evaluated fishing industry perspectives on sea-level rise risk and adaptation in three Florida coastal communities."
1	The drivers associated with Murray-Darling Basin irrigators? future farm adaptation strategies	Seidl, C.; Wheeler, S.A.; Zuo, A.	Journal of Rural Studies	2021	10.1016/j.jrurstud.2020.10.048	2	Irrigators in the Murray-Darling Basin.
1	Factors influencing the adoption of agroforestry by smallholder farmer households in Tanzania: Case studies from Morogoro and Dodoma	Jha, S.; Kaechele, H.; Sieber, S.	Land Use Policy	2021	10.1016/j.lusepol.2021.105308	4	This article aims to understand the most significant factors influencing the adoption of agroforestry.
1	Policy narratives on wooden multi-storey construction and implications for technology innovation system governance	Toivonen, R.; Vihemaki, H.; Toppinen, A.	Forest Policy and Economics	2021	10.1016/j.forpol.2021.102409	4	"This paper analyses policy narratives on WMC in Finland and reflects these against the governance of TIS." WMC= Wooden Multi-storey Construction; TIS= technological innovation system
1	The impact of climate change on edible food production: a panel data analysis	Gedik, M.A.; Gunel, T.	Acta Agriculturae Scandinavica Section B-Soil and Plant Science	2021	10.1080/09064710.2021.1897155	4	"The purpose of this study was to empirically investigate the way in which climate change impacts edible food production in 12 selected countries as they had the highest carbon emissions during the 1995-2014 period."
1	Fijian, fire and grazing in Southern Tibet? A 20,000-year multi-proxy record in an alpine ecotonal ecosystem	Miehe, G.; ul Hasson, S.; Glaser, B.; Mischke, S.; Bohner, J.; van der Knaap, W.O.; van Leeuwen, J.F.N.; Duo, L.; Miehe, S.; Haberzettl, T.	Quaternary Science Reviews	2021	10.1016/j.quascirev.2021.106817	4	"The lithology, ostracods, palynomorphs and black carbon of a sediment core from a saline wetland in the southern Tibetan highlands (29 degrees 14'33.40 " N/87 degrees 13'09.10 " E, 4480 m a.s.I., A.R. Xizang, China) is analyzed and climate modelling applied with respect to core questions in Quaternary research[...]"
1	Use of indigenous knowledge to predict rainfall in the Yendi Municipality, Ghana	Adanu, S.K.; Abole, T.; Gbedemah, S.F.	Geojournal	2021	10.1007/s10708-021-10403-8	4	"The objectives of this paper are to examine the extent to which indigenous knowledge has been used to predict rainfall, assess the reliability of such predictions and determine the agro-climatological information sources available to farmers."
1	Natural hazard's effect and farmers' perception: Perspectives from flash floods and landslides in remotely mountainous regions of Vietnam	Pham, N.T.T.; Nong, D.; Garschagen, M.	Science of the Total Environment	2021	10.1016/j.scitotenv.2020.142656	4	The abstract does not mention perception of climate change, but refers to disasters.
1	Innovative Aquaculture for the Poor to Adjust to Environmental Change in Coastal Bangladesh? Barriers and Options for Progress	Selim, S.A.; Glaser, M.; Tacke, F.I.; Rahman, M.; Ahmed, N.	Frontiers in Marine Science	2021	10.3389/fmars.2021.635281	4	"This article examines how poor Bangladeshi coastal residents view BWA, and what is needed to make BWA a viable and sustainable livelihood for the coastal poor." BWA= Brackish water aquaculture
1	Climate Change Totems and Discursive Hegemony Over the Arctic	Tam, C.L.; Chew, S.; Carvalho, A.; Doyle, J.	Frontiers in Communication	2021	10.3389/fcomm.2021.518759	4	"This Perspective article offers a reflexive analysis on the symbolic power of the polar bear totem and the discursive exclusion of Indigenous peoples, informed by attendance during 2015-2017 at annual global climate change negotiations and research during 2016-2018 in Canada's Nunavut Territory."
1	Are climate risks encouraging cover crop adoption among farmers in the southern Wabash River Basin?	Yoder, L.; Houser, M.; Bruce, A.; Sullivan, A.; Farmer, J.	Land Use Policy	2021	10.1016/j.landusepol.2020.105268	4	"This qualitative study draws on 33 semi-structured interviews with farmers to understand whether climate risks are driving the above-average rates of adoption in this area. "

1	Water Deficit and Hyper-Commodification in Paolo Bacigalupi's The Water Knife	Dharsini, P.	Literary Voice	2021		4	"The paper aims at exploring the ramifications of both water scarcity and the customized arcology development for water resources which is depicted in the novel The Water Knife."
1	Investigating the Conceptual Plurality of Empowerment through Community Concept Drawing: Case Studies from Senegal, Kenya, and Nepal	McOmber, C.; McNamara, K.; Ryley, T.D.; McKune, S.L.	Sustainability	2021	10.3390/su13063166	4	This study aims to identify and evaluate local cocnceptualization of women's empowerment.
1	Adaptation, spatial effects, and targeting: Evidence from Africa and Asia	Lim, K.; Wichmann, B.; Luckert, M.	World Development	2021	10.1016/j.worlddev.2020.105230	4	"This paper estimates spatial effects on adaptation: how neighbors' adaptations influence farmers' adaptation decisions."
1	Status of energy utilization and factors affecting rural households' adoption of biogas technology in north-western Ethiopia	Marie, M.; Yirga, F.; Alemu, G.; Azadi, H.	Heliyon	2021	10.1016/j.heliyon.2021.e06487	4	"This research was therefore undertaken to determine the actual energy consumption status and factors impacting the adoption of biogas technology by rural households in northwestern Ethiopia."
1	The Gunung Palung Orangutan Project: Twenty-five years at the intersection of research and conservation in a critical landscape in Indonesia	Knott, C.D.; Kane, E.E.; Achmad, M.; Barrow, E.J.; Bastian, M.L.; Beck, J.; Blackburn, A.; Breeden, T.L.; Brittain, N.L.C.; Brousseau, J.J.; Brown, E.R.; Brown, M.; Brubaker-Wittman, L.A.; Campbell-Smith, G.A.; de Sousa, A.; DiGiorgio, A.L.; Freund, C.A.; Gehrke, V.I.; Granados, A.; Harting, J.; Harwell, F.S.; Johnson, A.; Kanisius, P.; Kemsey, J.R.; Kurniawan, S.F.; Kurniawati, D.; Laman, T.G.; Marshall, A.J.; Naruri, R.; O'Connell, C.A.; Philp, B.J.; Rahman, E.; Riyandi; Robinson, N.J.; Scott, A.M.; Scott, K.S.; Setia, T.M.; Setiadi, W.; Setiawan, E.; Sumardi, I.; Suro, R.R.; Tamariska, F.W.; Thompson, M.E.; Yaap, B.; Susanto, T.W.	Biological Conservation	2021	10.1016/j.biocon.2020.108856	4	"A major goal of our broad-ranging research on orangutan behavior and ecology is to understand how the unique rainforest environment of Southeast Asia, characterized by dramatic changes in fruit productivity due to unpredictable mast fruiting, impacts orangutan behavior, physiology, and health."
1	Listening to Bats: Namibian Pastoralists' Perspectives, Stories, and Experiences	Laverty, T.M.; Teel, T.L.; Gawusab, A.A.; Berger, J.	Journal of Ethnobiology	2021	10.2993/0278-0771-41.1.70	4	"To address these knowledge gaps about African bats and their interactions with humans, we used semi-structured interviews of pastoralists in northwestern Namibia to assess local experiences with, attitudes toward, and cultural stories about bats."
1	Legumes as a sustainable source of protein in human diets	Semba, R.D.; Ramsing, R.; Rahman, N.; Kraemer, K.; Bloem, M.W.	Global Food Security-Agriculture Policy Economics and Environment	2021	10.1016/j.gfs.2021.100520	4	This paper presents an argument based on the sustainability of adopting a protein diet rich in vegetables.
1	What Drives Landowners to Resist Selling Their Land? Insights from Ethical Capitalism and Landowners' Perceptions	Petrescu-Mag, R.M.; Kopaei, H.R.; Petrescu, D.C.	Land	2021	10.3390/land10030312	4	"the aims of the paper were to bring to the fore critical reflection on a more ethical perspective of large-scale land acquisitions and to extend the scant information on what factors determine landowners not to sell their land to foreigners to limit land grabbing."
1	Identification, geographic distribution and risk factors of Brucella abortus and Brucella melitensis infection in cattle in Algeria	Lounes, N.; Melzer, F.; Sayour, A.E.; Maamar, H.T.; Rahal, K.; Benamrouche, N.; Lazri, M.; Bouyoucef, A.; Hendam, A.; Neubauer, H.; El-Adawy, H.	Veterinary Microbiology	2021	10.1016/j.vetmic.2021.109004	4	"This study aimed to identify Brucella species and biovars circulating in cattle and to analyze their geographic distribution across Algeria."
1	Transformative learning and community resilience to cyclones and storm surges: The case of coastal communities in Bangladesh	Choudhury, M.U.I.; Haque, C.E.; Hostetler, G.	International Journal of Disaster Risk Reduction	2021	10.1016/j.ijdrr.2021.102063	4	"To determine how transformative learning and risk-mitigation actions shape community resilience to climate-induced disasters, we carried out a mixed-method empirical investigation on the southern coast of Bangladesh."
1	Getting to a decision: using structured decision-making to gain consensus on approaches to invasive species control	van Poorten, B.; Beck, M.	Management of Biological Invasions	2021	10.3391/mbi.2021.12.1.03	4	"This article acts as a primer on SDM, discussing key considerations relevant to each step. We reinforce these steps by reporting on a case study using SDM. The problem we address is a non-native smallmouth bass (Micropterus dolumieui Lacepede, 1802) population discovered in Cultus Lake, British Columbia (BC), Canada, in 2018." SDM= Structured decision-making
1	Community awareness towards coastal hazard and adaptation strategies in Pahang coast of Malaysia	Islam, M.M.; Amir, A.A.; Begum, R.A.	Natural Hazards	2021	10.1007/s11069-021-04648-2	4	"this study aims to measure the levels of community awareness and adaptation strategies to coastal hazards and to analyze the differences of awareness on the basis of socioeconomic factors."
1	A comparative analysis to depict underlying attributes that might determine successful implementation of local adaptation plans	Rivas, S.; Hernandez, Y.; Urraca, R.; Barbosa, P.	Environmental Science & Policy	2021	10.1016/j.envsci.2020.12.002	6	"In this paper, we explore attributes of the first 51 cities that have submitted their adaptation plans to CoM, in order to identi f y common elements among accepted plans."
1	Farmers' decision to use drought early warning system in developing countries	Sharafi, L.; Zarafshani, K.; Keshavarz, M.; Azadi, H.; Van Passel, S.	Science of the Total Environment	2021	10.1016/j.scitotenv.2020.142761	4	"the aim of this study was to investigate the decision of farmers to use climate knowledge through the model of farming activity in Kermanshah Township, Iran."
1	Climate change adaptation strategies and their predictors amongst rural farmers in Ambassel district, Northern Ethiopia	Destaw, F.; Fenta, M.M.	Jamba-Journal of Disaster Risk Studies	2021	10.4102/jamba.v13i1.974	4	"The present study was conducted in Ambassel district of Northern Ethiopia to understand adaptation strategies employed by rural farmers to the adverse effects of climate change and variability and factors that determine their adaptation decisions."
1	Decision-making capacity to address climate-induced food insecurity within women-led groups in Southern Mali	Wood, A.L.; Rivers, L.; Sidbe, A.; Ligmann-Zielinska, A.	Climatic Change	2021	10.1007/s10584-021-03003-5	4	"The following study examines climate change in Mali, and its impacts on food security. This will be explored through the experiences of women, using feminist political ecology as an analytical framework."

1	Socio-psychological factors, beyond knowledge, predict people's engagement in pollinator conservation	Knapp, J.L.; Phillips, B.B.; Clements, J.; Shaw, R.F.; Osborne, J.L.	People and Nature	2021	10.1002/pan3.10168	4	It's na assessment about the drivers of people's engagement in pollinator conservation.
1	Over 30 years of HABs in the Philippines and Malaysia: What have we learned?	Yniguez, A.T.; Lim, P.T.; Leaw, C.P.; Jipanin, S.J.; Iwataki, M.; Benico, G.; Azanza, R.V.	Harmful Algae	2021	10.1016/j.hal.2020.101776	4	"Using long-term observations of HAB events, we determined if these are increasing in frequency and duration, and expanding across space in each country." HAB= Harmful Algal Blooms
1	Understanding the determinants of climate change adaptation strategies among smallholder maize farmers in South-west, Nigeria	Adeagbo, O.A.; Ojo, T.O.; Adetoro, A.A.	Heliyon	2021	10.1016/j.heliyon.2021.e06231	2	Maize monoculture producers. The abstract mentions smallholders.
1	Exploration of the environmental and socioeconomic implications of HCFC-22 phase-out for Botswana	Kudoma, B.; Tekere, M.	Advances in Climate Change Research	2021	10.1016/j.accre.2020.12.002	4	"This study focused on evaluating the environmental and socioeconomic implications of phasing out HCFC-22 in Botswana."
8	Climate Change Adaptation by Smallholder Tea Farmers: a Case Study of Nepal	Muench, S.; Bavorova, M.; Pradhan, P.	Environmental Science & Policy	2021	10.1016/j.envsci.2020.10.012	2	Tea farmers
1	Towards Intangible Freshwater Cultural Ecosystem Services: Informing Sustainable Water Resources Management	Ncube, S.; Beevers, L.; Momblanch, A.	Water	2021	10.3390/w13040535	4	"This study utilizes a questionnaire-based survey to capture views from two villages along the mainstream of the Beas River in India, to identify the CES it provides, to assess how local communities appreciate their importance and how they relate to river flows." CES= Cultural Ecosystem Services
1	Crop diversification in rice-based systems in the polders of Bangladesh: Yield stability, profitability, and associated risk	Assefa, Y.; Yadav, S.; Mondal, M.K.; Bhattacharya, J.; Parvin, R.; Sarker, S.R.; Rahman, M.; Sutradhar, A.; Prasad, P.V.V.; Bhandari, H.; Shew, A.M.; Jagadish, S.V.K.	Agricultural Systems	2021	10.1016/j.agsy.2020.102986	4	"The objectives were to quantify yield gaps and spatiotemporal variability in rice production, evaluate various rice-based cropping systems for yield and profitability, and investigate individual crop and system-based stability and resilience in the coastal zone."
7	Strengthening the knowledge base to face the impacts of climate change on water resources in Africa: A social innovation perspective	Wehn, U.; Vallejo, B.; Seijger, C.; Tlhagale, M.; Amorsi, N.; Sossou, S.K.; Genthe, B.; Onema, J.M.K.	Environmental Science & Policy	2021	10.1016/j.envsci.2020.09.026	4	The aim of the paper is twofold: i) to provide subject-specific insights by analyzing the current knowledge base in Africa given water-related challenges due to climate change, and ii) to offer methodological insights into how a knowledge base can be studied comprehensively.
1	Innovation through consultation: Stakeholder perceptions of a novel fisheries management system reveal flexible approach to solving fisheries challenges	Pedreschi, D.; Vigier, A.; Hoffle, H.; Kraak, S.B.M.; Reid, D.G.	Marine Policy	2021	10.1016/j.marpol.2020.104337	4	"This paper details the consultative process carried out with Irish demersal fishery stakeholders in an effort to identify their likes and dislikes of the system, and work towards tailoring the RTI system into a practical solution that works for them."
1	Explaining the use of online agricultural decision support tools with weather or climate information in the Midwestern United States	Lu, J.Y.; Singh, A.S.; Koundinya, V.; Ranjan, P.; Haigh, T.; Getson, J.M.; Klink, J.; Prokopy, L.S.	Journal of Environmental Management	2021	10.1016/j.jenvman.2020.111758	4	"This study surveyed farmers (n = 2,633) and advisors (n = 2,719) across 12 states in the Midwest to draw comparisons on their usage of DSTs and factors influencing the usage."
1	Developing farmer typologies to inform conservation outreach in agricultural landscapes	Upadhaya, S.; Arbuckle, J.G.; Schulte, L.A.	Land Use Policy	2021	10.1016/j.landusepol.2020.105157	4	"To inform the development of more effective conservation outreach and incentive programs, we created a farmer typology using data from three waves (2015, 2016, 2018) of a longitudinal survey of 358 farmers from Iowa, a highly productive agricultural state in the U.S. Midwest. "
1	Simulation of soil loss under different climatic conditions and agricultural farming economic benefits: The example of Yulin City on Loess Plateau	Wang, H.B.; Xie, T.Y.; Yu, X.H.; Zhang, C.	Agricultural Water Management	2021	10.1016/j.agwat.2020.106462	4	"analysis of the impact of soil erosion on agricultural sustainable planting under different climates was conducted."
1	Spatial and temporal scales of coral reef fish ecological research and management: a systematic map protocol	Lawrence, A.; Heenan, A.; Levine, A.; Haddaway, N.R.; Powell, F.; Wedding, L.; Roche, R.; Lawrence, P.; Szostek, C.; Ford, H.; Southworth, L.; Pilly, S.S.; Richardson, L.E.; Williams, G.J.	Environmental Evidence	2021	10.1186/s13750-021-00217-z	4	"We will use the Collaboration for Environmental Evidence (CEE) systematic mapping guidelines to identify relevant studies using a framework-based synthesis to summarise the spatial and temporal scales of coral reef fish ecology research and the scales at which management inferences or recommendations are made."
1	Smallholder farmers' adaptation strategies to mitigate the effect of drought on maize production in OR Tambo District municipality	Muroyiwa, B.; Masinda, N.; Mushunje, A.	African Journal of Science Technology Innovation & Development	2021	10.1080/20421338.2020.1847385	4	"This study examined smallholder farmers' adaptation strategies to mitigate the effects of drought on maize production in OR Tambo District in South Africa."
1	Framing biophysical and societal implications ofmultiple stressor effects on river networks	Sabater, S.; Elosegi, A.; Ludwig, R.	Science of the Total Environment	2021	10.1016/j.scitotenv.2020.141973	4	This article discusses how to incorporate complex aspects relating the stressor effects on river networks and human societies to present frameworks considering biophysical and societal consequences of multiple stressors, to better understand and manage the effects being caused on river networks.

1	The Synergistic Impacts of Anthropogenic Stressors and COVID-19 on Aquaculture: A Current Global Perspective	Sara, G.; Mangano, M.C.; Berlino, M.; Corbari, L.; Lucchese, M.; Milisenda, G.; Terzo, S.; Azaza, M.S.; Babarro, J.M.F.; Bakiu, R.; Broitman, B.R.; Buschmann, A.H.; Christofoletti, R.; Deidun, A.; Dong, Y.; Galdies, J.; Glamuzina, B.; Luthman, O.; Makridis, P.; Nogueira, A.J.A.; Palomo, M.G.; Dineshram, R.; Rilov, G.; Sanchez-Jerez, P.; Sevgili, H.; Troell, M.; AbouelFadl, K.Y.; Azra, M.N.; Britz, P.; Brugere, C.; Carrington, E.; Celic, I.; Choi, F.; Qin, C.; Dobroslavic, T.; Galli, P.; Giannetto, D.; Grabowski, J.; Lebata-Ramos, M.J.H.; Lim, P.T.; Liu, Y.; Llorens, S.M.; Maricchiolo, G.; Mirto, S.; Pecarevic, M.; Ragg, N.; Ravagnan, E.; Saidi, D.; Schultz, K.; Shaltout, M.; Solidoro, C.; Tan, S.H.; Thiyagarajan, V.; Helmuth, B.	Reviews in Fisheries Science & Aquaculture	2021	10.1080/23308249.2021.1876633	4	"A web survey was conducted in 47 countries in the midst of the COVID-19 pandemic to assess how aquaculture activities have been affected by the pandemic, and to explore how these impacts compare to those from climate change."
1	Fine-Tuning Climate Resilience in Marine Socio-Ecological Systems: The Need for Accurate Space-Time Representativeness to Identify Relevant Consequences and Responses	Saldivar-Lucio, R.; Trasvina-Castro, A.; Jiddawi, N.; Chuenpagdee, R.; Lindstrom, L.; Jentoft, S.; Fraga, J.; de la Torre-Castro, M.	Frontiers in Marine Science	2021	10.3389/fmars.2020.600403	3	Does not mention small-scale populations
1	Promoting sustainability education through hands-on approaches: a tree carbon sequestration exercise in a Singapore green space	Ramchunder, S.J.; Ziegler, A.D.	Sustainability Science	2021	10.1007/s11625-020-00897-5	3	The target audience were university students
1	Social networks influence farming practices and agrarian sustainability	Albizua, A.; Bennett, E.M.; Larocque, G.; Krause, R.W.; Pascual, U.	Plos One	2021	10.1371/journal.pone.0244619	4	"We explore farmers' perceptions about the impacts of their land management and the impact of social information flows on their management through a case study in a farming community in Navarra, Spain, that is undergoing agricultural intensification due to adoption of large scale irrigation."
1	Gender-based differences in flood vulnerability among men and women in the char farming households of Bangladesh	Naz, F.; Saqib, S.E.	Natural Hazards	2021	10.1007/s11069-020-04482-y	4	"Therefore, this study examines men and women's level of vulnerabilities and their choices of livelihood practices in char farming households in Zanjira, Bangladesh."
1	Livelihood resilience and strategies of rural residents of earthquake-threatened areas in Sichuan Province, China	Zhou, W.F.; Guo, S.L.; Deng, X.; Xu, D.D.	Natural Hazards	2021	10.1007/s11069-020-04460-4	4	"Based on a survey of 327 households in four districts and counties of Sichuan Province, China that were affected by the Wenchuan and Lushan earthquakes, we construct a framework for analyzing livelihood resilience and livelihood strategy selection."
1	Incorporating Land Use Changes and Pastoralists' Behavior in Sustainable Rangeland Management: Evidence from Iran	Azarm, H.; Bakhshoodeh, M.; Zibaei, M.; Nasrnia, F.	Rangeland Ecology & Management	2021	10.1016/j.rama.2021.09.009	4	"In this study, the land use changes of Iran Kishlak pastoralist settlements were initially predicted using the Markov chain model and the vulnerability of the study area was determined using the fuzzy analytic hierarchy process in terms of environmental stresses during various years."
1	Reclaiming Foodscapes and their Role in the Future of Gastronomy	Alden, J.	Locale-The Australian-Pacific Journal Of Regional Food Studies	2021		4	"Our gastronomy story is about innovating and adapting to new landscapes while learning from our Dja Dja Wurrung heritage, to celebrate environmental aesthetics by new approaches to growing, sourcing, cooking and sharing food in the community."
1	Determinants of Perception and Impact of Climate Change Induced Events on Livelihood of People in the Haor Area of Kishoreganj, Bangladesh	Baten, M.A.; Hossain, M.K.	Journal Of Climate Change	2021	10.3233/JCC210021	3	The abstract doesn't mention if the farmers are smallholders.
1	The Blue Economy in the European Union: Valuation of Spanish Small-Scale Fishers' Perceptions on Environmental and Socioeconomic Effects	Garza-Gil, M.D.; Varela-Lafuente, M.M.; Perez-Perez, M.I.	Panoeconomicus	2021	10.2298/PAN180425013G	4	"This paper studies the Spanish fishers' perceptions to the linkages between the Blue Growth and small-scale fishing."
1	Extent and evaluation of flood resilience in Muzaffarabad City, Azad Jammu and Kashmir, Pakistan	Ayub, M.; Rahman, A.U.; Samiullah; Khan, A.	Journal Of Himalayan Earth Sciences	2021		4	"In this research an attempt has been made to explore the extent and evaluation of flood resilience in the mountainous environment of the study area. "
1	The cost and benefit analysis of climate change adaptation strategies among smallholder crop producers in the case of Sekela district, West Gojjam zone, Ethiopia	Tilahun, Y.	Cogent Economics & Finance	2021	10.1080/23322039.2021.1999590	4	"Therefore, this study aimed to identify determinants of farmer adaptation strategies with their costs and benefits of each adaptation strategy."
1	Farmer flexibility concerning future rotation planning is affected by the framing of climate predictions	Bane, M.S.; Pocock, M.J.O.; Gibert, C.; Forster, M.; Oudoire, G.; Derocles, S.A.P.; Bohan, D.A.	Climate Risk Management	2021	10.1016/j.crm.2021.100356	4	"Our aim was to assess farmers' attitudes to planning and diversifying crop rotations, focusing on their responses in the face of contrasting climate viewpoints."
1	Smallholder sheep farmers' perceived impact of water scarcity in the dry ecozones of South Africa: Determinants and response strategies	Halimani, T.; Marandure, T.; Chikwanha, O.C.; Molotsi, A.H.; Abiodun, B.J.; Dzama, K.; Mapiye, C.	Climate Risk Management	2021	10.1016/j.crm.2021.100369	4	"Two-hundred and fifty-two structured questionnaires were administered to investigate the contextual factors that influence smallholder farmers' perceived impact of water scarcity on sheep production in the dry ecozones of the Cape provinces in South Africa and identify their local response strategies."

1	It depends on the rain: Smallholder farmers' perceptions on the seasonality of feed gaps and how it affects livestock in semi-arid and arid regions in Southern Africa	Lamega, S.A.; Komainda, M.; Hoffmann, M.P.; Ayisi, K.K.; Odhiambo, J.J.O.; Isselstein, J.	Climate Risk Management	2021	10.1016/j.crm.2021.100362	4	"We chose the Limpopo province, of northern South Africa to study livestock farmers' perceptions of the temporal patterns of feed gaps and their perceived impacts on livestock production across different agro-ecological zones (AEZ) and farm types (i.e., livestock only, mixed crop-livestock farms)."
1	Adaptation strategies and land productivity of banana farmers under climate change in China	Zhu, Y.J.; Yang, Q.; Zhang, C.	Climate Risk Management	2021	10.1016/j.crm.2021.100368	4	"This paper is the first attempt to examine the heterogeneous impact of social ties on farmers' adaptation decisions, and further assess the effect of adaptation strategies on land productivity under climate change using Augmented Inverse Probability Weights (AIPW) estimator, based on the primary data collected from banana farmers in China."
1	Effects of post-veraison irrigation on the phenolic composition of Vitis vinifera L. cv. 'Xinomavro' grapes	Theocharis, S.; Nikolaou, N.; Zioziou, E.; Kyraleou, M.; Kallithraka, S.; Kotseridis, Y.; Koundouras, S.	Oeno One	2021	10.20870/oeno-one.2021.55.3.4706	4	"This study aimed to determine the effect of post-veraison irrigation on berry anthocyanin and proanthocyanidin amount and composition, of field-grown Xinomavro vines (Vitis vinifera L.), under the typical summer conditions of Northern Greece. "
1	Adaptation Strategies to droutgh among smallholder farmers in Southern Leyte, Philippines	Diacamos, Q.V.; Ramoneda, B.M.; Serino, M.N.V.; Tambis, M.M.; Bellezas, M.H.I.	Scientific Papers-Series Management Economic Engineering In Agriculture And Rural Development	2021		4	"This study aimed to identify the determinants of farmer's adaptation strategies to drought in selected municipalities of Southern Leyte, Philippines."
1	Strategies adopted by Yam farmers in combating climate change in Kogi State Nigeria	Ogunjimi, S.; Ikefusi, N.	Scientific Papers-Series Management Economic Engineering In Agriculture And Rural Development	2021		3	Yam farmers, no mention to smallholders.
1	Perceptions and realities of hydroclimatic change affecting Guyanese rice farming	Mahdu, O.; Ellis, A.W.	Climate Risk Management	2021	10.1016/j.crm.2021.100341	2	It mentions smallholders but they're also rice producers.
1	A policy tool for monitoring and evaluation of participation in adaptation projects	Wojewska, A.N.; Singh, C.; Hansen, C.P.	Climate Risk Management	2021	10.1016/j.crm.2021.100326	4	"This paper addresses this gap by proposing a conceptual framework for planning, monitoring, and evaluating climate adaptation interventions that draws upon the decision-making literature."
1	Perception of climate change - A survey among agricultural advisors	Zutinic, D.; Susac, M.Z.	Ekonomika Poljoprivreda-Economics Of Agriculture	2021	10.5937/ekoPolj2102307Z	3	"The main goal of the study was to determine the opinions and attitudes of agricultural advisors on climate change."
1	Improving the effectiveness of agricultural extension services in supporting farmers to adapt to climate change: Insights from northeastern Ghana	Antwi-Agyei, P.; Stringer, L.C.	Climate Risk Management	2021	10.1016/j.crm.2021.100304	4	"This paper aims to identify how agricultural extension agents in Ghana can better support smallholder farmers in navigating and addressing the effects of climate change on food production."
1	Evaluating the climate resilience in terms of profitability and risk for a long-term corn-soybean-wheat rotation under different treatment systems	Eeswaran, R.; Nejadhashemi, A.P.; Miller, S.R.	Climate Risk Management	2021	10.1016/j.crm.2021.100284	4	"Hence, we evaluated the climate resilience of three alternative agricultural treatments for a longterm (27-years) rotation of corn-soybean-wheat, cast in the temperate humid climate of Southwest Michigan, United States."
1	Mapping the evolution and current trends in climate change adaptation science	Nalau, J.; Verrall, B.	Climate Risk Management	2021	10.1016/j.crm.2021.100290	8	"This paper fills this gap by providing a multifaceted bibliometric review of climate change adaptation science literature that is focused on the human dimensions and how it has been constructed across time, disciplines, social relationships and geographies."
1	Managing extreme weather and climate change in UK agriculture: Impacts, attitudes and action among farmers and stakeholders	Wheeler, R.; Lobley, M.	Climate Risk Management	2021	10.1016/j.crm.2021.100313	3	The abstract does not mention if the farmers are smallholders
1	Tourists' perspectives of marine ecosystem services as the first stage of participatory modeling in the South Coast of São Paulo	Amazonas, L.; Meirelles, B.; Belosevich, P.; Cichoski, C.; Turra, A.; Kampel, M.; Jacobi, P.R.; Sinisgalli, P.A.	Anais Brasileiros De Estudos Turisticos-Abet	2021		4	"As part of a modeling process, this work explores tourists' perspective of marine ecosystem services, conditions considered in destination choice, and their reaction to changes in seawater quality through a semi structured survey at the municipality of Ubatuba, Sao Paulo, Brazil."
1	Agrifood tourism, rural resilience, and recovery in a postdisaster context: insights and evidence from Kaikoura-Hurunui, New Zealand	Fountain, J.; Cradock-Henry, N.; Buelow, F.; Rennie, H.	Tourism Analysis	2021	10.3727/108354221X16079839951420	4	"Drawing on empirical evidence and insights from a range of affected stakeholders, including food producers, tourism operators. and local government, we explore the significance of emerging agrifood tourism initiatives for fostering diversity, enhancing connectivity, and building resilience in the context of rural recovery."
1	Developing a Conceptual Model for Identifying Determinants of Climate Change Adaptation	Kabir, M.H.; Alam, M.M.	Journal Of Climate Change	2021	10.3233/JCC210003	4	"Thus, the current study attempted to propose a conceptual model for assessing the determinants of farmers' adaptation to climate change in Bangladesh."
1	Valuing the invaluable: park visitors' perceived importance and willingness to pay for urban park trees in Pakistan	Malik, A.; Zubair, M.; Manzoor, S.A.	Ecosphere	2021	10.1002/ecs2.3348	6	Urban parks
1	Perception and Conflict in Conservation: The Rashomon Effect	Levin, P.S.; Gray, S.A.; Mollmann, C.; Stier, A.C.	Bioscience	2021	10.1093/biosci/biaa117	4	"In the present article, we explore a conservation Rashomon effect-a phenomenon that results from a combination of differences in perspective, plausible alternative perspectives of a conservation issue, and the absence of evidence to elevate one perspective above others."
1	Impact of Climate Change on the Production of Coffea arabica at Mt. Kilimanjaro, Tanzania	Wagner, S.; Jassogne, L.; Price, E.; Jones, M.; Preziosi, R.	Agriculture-Basel	2021	10.3390/agriculture11010053	2	Monoculture coffee growers.

1	The future protection from the climate change-related hazards and the willingness to pay for home insurance in the coastal wetlands of West Sardinia, Italy	Ivcevic, A.; Statzu, V.; Satta, A.; Bertoldo, R.	International Journal Of Disaster Risk Reduction	2021	10.1016/j.ijdrr.2020.101956	4	"It is, therefore, important to examine how the local population understands the importance of wetlands in coping with different coastal risks in West Sardinia."
1	Understanding farmers' risk perception to drought vulnerability in Balochistan, Pakistan	Durrani, H.; Syed, A.; Khan, A.; Tareen, A.; Durrani, N.A.; Khwajakhail, B.A.	Aims Agriculture And Food	2021	10.3934/agrfood.2021006	3	The abstract does not mention if the farmers are smallholders.
1	Integrated watershed management on soil quality, crop productivity and climate change adaptation, dry highland of Northeast Ethiopia	Mekonnen, M.; Abeje, T.; Addisu, S.	Agricultural Systems	2021	10.1016/j.agsy.2020.102964	4	"Thus, this research is aimed to (i) investigate the impacts of SWCPs on soil physical and chemical properties, (ii) quantify the carbon stock trapped by the SWCPs, (iii) assess barley grain yield and (iv) evaluate farmers' perception on climate change adaptive strategies."
1	Application of ecosystem service flows model in water security assessment: A case study in Weihe River Basin, China	Zhang, C.; Li, J.; Zhou, Z.X.; Sun, Y.J.	Ecological Indicators	2021	10.1016/j.ecolind.2020.106974	4	"In our study, ecosystem service flows model was integrated into water security assessment to simulate the spatial patterns of water security in Weihe River Basin (WRB) from 2005 to 2015."
1	How do rural-urban linkages change after an extreme flood event? Empirical evidence from rural communities in Pakistan	Jamshed, A.; Birkmann, J.; McMillan, J.M.; Rana, I.A.; Feldmeyer, D.; Sauter, H.	Science Of The Total Environment	2021	10.1016/j.scitotenv.2020.141462	4	"Therefore, this study investigates the impacts of a flood event on linkages between rural and urban areas of Pakistan. This study also examines socioeconomic and spatial factors that can influence changes in rural-urban linkages."
5	Chapitre 3. La transcription des savoirs thérapeutiques traditionnels à la lumière des droits des peuples autochtones	Nicolas, G.	J Int Bioethique Ethique Sci	2021	10.3917/jibes.323.0051	4	Article in French about traditional knowledge and its therapeutic potential.
23	Are climate change and mental health correlated?	Ramadan, A.M.H.; Ataallah, A.G.	Gen Psychiatr	2021	10.1136/gpsych-2021-100648	4	This paper was written with the aim of trying to understand the currently, scientifically proven impact of climate change-related disasters on mental health and understanding the different methods of solving the problem at the corporate level, by trying to decrease greenhouse gas emissions to zero, and at the individual level by learning how to cope with the impacts of those disasters.
24	Risk perception of climate change and natural hazards in global mountain regions: A critical review	Schneiderbauer, S.; Fontanella Pisa, P.; Delves, J.L.; Pedoth, L.; Rufat, S.; Erschbamer, M.; Thaler, T.; Carnelli, F.; Granados-Chahin, S.	Sci Total Environ	2021	10.1016/j.scitotenv.2021.146957	8	This article presents the findings of a literature review of recent English language publications on risk perception in connection to climate change and related natural hazards in mountain regions worldwide.
5	Potential Impacts of Extreme Heat and Bushfires on Dementia	Farugia, T.L.; Cuni-Lopez, C.; White, A.R.	J Alzheimers Dis	2021	10.3233/JAD-201388	8	This review explores the differential diagnosis of dementia, the Australian climate, and the potential impact Australia's extreme heat and bushfires have on individuals from vulnerable communities including low socioeconomic status Indigenous and Non-Indigenous populations living with dementia, in both metropolitan and rural communities.
22	Integrating functional traits into correlative species distribution models to investigate the vulnerability of marine human activities to climate change	Bosch-Belmar, M.;Giommi, C.;Milisenda, G.;Abbruzzo, A.;Sarà, G.	Science of The Total Environment	2021	10.1016/j.scitotenv.2021.149351	4	In the current study, we propose the use of combined correlative SDMs and mechanistic models, based on individual thermal performance curve models calculated through non-linear least squares regression and Bayesian statistics (functional-SDM), as an ecological relevant tool to increase our ability to investigate the potential indirect effect of climate change on the distributions of harmful species for human activities at sea, taking aquaculture as a food productive example and the benthic cnidarian Pennaria disticha (one of the most pernicious fouling species in aquaculture) as model species.
26	Changing climate, changing discourse: Analyzing reporting of climate change and economic development in the U.S. Virgin Islands	Rudge, K.	Climate Risk Management	2021	10.1016/j.crm.2021.100350	3	To analyze these problems, this study examined news discourse around the issues of climate change, economic development, and community engagement. By understanding discourse in local media, this study aims to evaluate the construction of knowledge regarding these issues and demonstrate areas of deficiency that should be addressed.
26	Evaluating drivers and barriers to adopting a local energy policy under The Covenant of Mayors Initiative in the Small Island State of Malta	Buga, N.;Yousif, C.	Energy Policy	2021	10.1016/j.enpol.2021.112586	4	The progress of the CoM in Malta and Gozo is evaluated; evidence suggests that signatories have not sufficiently fulfilled their obligations to the initiative and there has been little contribution of the CoM to the local reduction of CO2 emissions and energy consumption for the 2020 set of targets for Malta. CoM = Covenant of Mayors
4	Social resilience and climate change: findings from community listening sessions	Sifuentes, J.E.;York, E.;Fultineer, C.	The Lancet Planetary Health	2021	10.1016/S2542-5196(21)00087-5	3	In 2019, four community listening sessions were convened on the topics of climate change and social resilience: with a Latinx community (facilitated in Spanish), with African-American and African immigrant communities, with an urban Native American community, and with a white community.
4	Toxicological risks on the human health of populations living around the Mediterranean Sea linked to the invasion of non-indigenous marine species from the Red Sea: A review	Bédry, R.;de Haro, L.;Bentur, Y.;Senechal, N.;Galil, B.S.	Toxicon	2021	10.1016/j.toxicon.2020.12.012	4	Invasora species
4	Chapter 17 - Changing climate and depleting water resources in the mountains with a case study from the Himalayas	Sharma, A.;Choudhury, M.	Book: Water Conservation in the Era of Global Climate Change	2021	10.1016/B978-0-12-820200-5.00013-0	10	The Chapter is part of the book "Water Conservation in the Era of Global Climate Change", therefore, it will not be included in the selection. Thus, the chapter is mainly focused on highlighting the intricate relationship between growing issue of climate change and diminishing water sources, the significant sources and patterns of utilization of water in the hilly regions and the matters of water wastage, public attitude, consequences, and conservation strategies with the help of a case study.
10	Considering socio-political framings when analyzing coastal climate change effects can prevent maldevelopment on small islands	David, C.G.; Hennig, A.; Ratter, B.M.W.; Roeber, V.; Zahid; Schlurmann, T.	Nature Communications	2021	10.1038/s41467-021-26082-5	4	To review these perceptions, natural dynamics are recreated with process-based methods and discussed regarding present and projected marine pressures. Population surveys and interviews with actors in coastal development complement the physical insights into erosion on Fuvahmulah and describe the socio-political dimension of climate change adaptation on small islands
1	Private sector climate change adaptation of accommodation suppliers in the small island of Koh Tao, Thailand	Hess, J.S.	Asian Geographer	2021	10.1080/10225706.2021.1981956	4	Against this background, this study investigates to what extent accommodation owner-managers do recognize climate change in their strategic investment decisions. A survey with 112 respondents and in-depth interviews with 16 interviewees were conducted on Koh Tao, Thailand. The findings reveal that most businesses (private sector) already invest in adaptation, whereas it appears to be a rather reactive (unconscious) form of adaptation.
10	University students' perceptions of climate change: the case study of the University of the South Pacific-Fiji Islands	Prasad, R.R.; Mkumbachi, R.L.	International Journal of Climate Change Strategies and Management	2021	10.1108/IJCCSM-12-2020-0126	3	The study aims to understand the main ideas and concepts of climate change by analyzing information habits and individual opinions on the causes of climate change as perceived by the students of two student organizations aimed at environmental protection.

10	Climate Change Adaptation on Small Island States: An Assessment of Limits and Constraints	Leal, W.; Krishnapillai, M.; Sidsaph, H.; Nagy, G.J.; Luetz, J.M.; Dyer, J.; Ha'apio, M.O.; Havea, P.H.; Raj, K.; Singh, P.; Rogers, T.; Li, C.L.; Boodhan, M.K.; Wolf, F.; Ayal, D.Y.; Azadi, H.	Journal of Marine Science and Engineering	2021	10.3390/jmse9060602	4	This paper addressed a perceived need for research into the limitations of adaptation on SIDS, focusing on the many unique restrictions. To this end, the study identified and described the adaptation limits they have by using a review of the literature and an analysis of case studies from a sample of five SIDS in the Caribbean and Pacific regions (Barbados, Trinidad and Tobago, Cook Islands, Fiji, Solomon Islands and Tonga).
10	Uncovering multilayered vulnerability and resilience in rural villages in the Pacific: a case study of Ono Island, Fiji	Hidalgo, D.M.; Nunn, P.D.; Beazley, H.	Ecology and Society	2021	10.5751/ES-12197-260126	4	The aim of the framework is to provide the conceptual basis from which the two concepts can be applied in conjunction, rather than prescribing specific indicators. The proposed framework was applied using a participatory action research approach to identify drivers of resilience and vulnerability in three coastal villages on a peripheral rural island in Fiji.
1	Climate adaptation within the tourism sector of a small island developing state: A case study from the coastal accommodations subsector in the Bahamas	Pathak, A.; van Beynen, P.E.; Akiwumi, F.A.; Lindeman, K.C.	Business Strategy and Development	2021	10.1002/bsd2.160	4	Using the Bahamas as a case study, this study presents findings from a survey administered with property managers from the coastal accommodations sector to identify their adaptation strategies to tackle climate change. We also evaluate their adaptive capacity by developing SIDS-specific indicators based on a capitals approach.
2	Vertical travel, the sense of place, and the environmentalism of the poor: climate change in Frank Smith's Katrina: Isle de Jean Charles, Louisiane	Baage, S.U.	Studies in Travel Writing	2021	10.1080/13645145.2022.2041283	4	This chapter examines Smith's unconventional approach to the representation of the environmental uncanny he witnesses during his journeys to Louisiana where rising tides and climate change threaten a small island community in the bayous, that of the Biloxi-Chitimacha-Choctaw Native Americans, America's first climate refugees.
3	Climate variability and adaptation among small holder banana farmers in mountain regions of Kenya.	Karienye, D. K.; Nduru, G. M.; Kamiri, H. W.	Geography, Environment, Sustainability	2021	10.24057/2071-9388-2019-27	4	This paper therefore discusses climate trends, related impacts, and adaptations in banana value chain in Mt. Kenya region for the period between 1980 and 2017.
3	Assessing the impact of the adoption of agroforestry technology on food production and poverty reduction among farming households in Oyo State, Nigeria.	Idumah, F. O.; Awe, F.; Orumwense, L. A.; Olarewaju, T. O.; Oke, D. O.	Acta Fytotechnica et Zootechnica	2021		4	This study determines the impact of agroforestry practices on food production, income generation and poverty reduction among farming households in Oyo State, Nigeria
3	Determinants of use of climate change adaptation practices by rice farmers in Kebbi state, north-west Nigeria.	Yakubu, D. H.; Oladele, O. I.	Problems of World Agriculture/Problemy Rolnictwa Światowego	2021	10.22630/PRS.2021.21.1.4	4	This study therefore investigated the determinants of use of climate change adaptation practices among rice farmers in Kebbi State, North-West, Nigeria.
3	Empowering Gili Ketapang Island: Dissemination of Environmentally Friendly Photovoltaic Technology to the Young Generation.	Cahyono, Y.; Dwihapsari, Y.; Baqiya, M. A.; Sukamto, H.; Arifin, Z.; Purwaningsih, S. Y.; Darminto, D.	Jurnal Pengabdian kepada Masyarakat (Indonesian Journal of Community Engagement)	2021	10.22146/jpkm.38330	4	Article about the electricity sector, renewable energy sources, especially photovoltaic technology.
3	Adoption of Agroforestry in Northwest Viet Nam: What Roles Do Social and Cultural Norms Play?	Nguyen, M. P.; Pagella, T.; Catacutan, D. C.; Nguyen, T. Q.; Sinclair, F.	Forests	2021	10.3390/f12040493	4	This article presents research about the influences of social and cultural norms on the adoption of agroforestry in the northwest mountainous region of Viet Nam.
3	Océanitude and Pacific regionalism in the wake of climate change	Ledderucci, C.	Pacific Geographies	2021	10.23791/550410	4	This paper rethinks Pacific grassroots regionalism in the wake of climate change and its impacts in Oceania.
3	Ethnic identity erosion in the indigenous Nenets population under globalization influence: gender differences between adolescent girls and boys.	Telitsyna, A.; Zabelina, E.; Kurnosova, S.	SHS Web of Conferences	2021	10.1051/shsconf/20219207062	4	The purpose of this study is to examine gender differences in ethnic identity erosion in the adolescent indigenous Nenets population of the Russian Siberian Arctic Region.
3	Unpacking the processes that catalyzed the adoption of best management practices for lowland irrigated rice in the Mekong Delta.	Flor, R. J.; Tuan, L. A.;Hung, N. V.; My Phung, N. T.; Connor, M.; Stuart, A. M.; Singleton, G. R.	Agronomy	2021	10.3390/agronomy11091707	4	This review traces the technological development and uptake of 1M5R in national policies and by end-users.
3	Vulnerability of Fishing and Fisheries Sector to Climate Change and Non-climate Risks as Perceived by Fishermen in Zanzibar Coastal Villages.	Makame, O. M.; Salum, L. A.	Carnets de Recherches de l'océan Indien	2021	10.26171/carnets-oi_0711	3	Does not mention small-scale fishers.
3	Malaria interventions and control programes in Sub-Saharan Africa: A narrative review	Orok, A. B.; Ajibaye, O.; Aina, O. O.; Iboma, G.; Adagyo Oboshi, S.; Iwalokun, B.	Cogent Medicine	2021	10.1080/2331205X.2021.1940639	4	Article about malaria transmission.
3	Understanding the effect of shifting cultivation practice (slash-burn-cultivation-abandonment) on soil physicochemical properties in the North-eastern Himalayan region	Mishra, G.; Giri, K.; Jangir, A.; Vasu, D.; Rodrigo-Comino, J.	Investigaciones Geográficas	2021	10.14198/INGEO.17820	4	This study assesses the effect of shifting cultivation cycles on soil quality in the North-eastern Himalayan region using a minimum of soil properties.
3	Renewable Energy in Russia: System Analysis of Barriers.	Ljovkina, A.; Brody, M.; Karagulyan, E.; Zakharova, A.; Ljovkin, V.	BRICS Law Journal	2021	10.21684/2412-2343-2021-8-2-89-119	4	The article proposes the analytical methodology, which reveals system specifications of the national RES development barriers and predicts the chain reaction of overcoming particular barriers.
3	Contending Philosophical Foundation in International Wildlife Law: A Discourse Analysis of CITES and the Bern Convention	Rodriguez Goyes, D.	Revista Catalana de Dret Ambiental	2021	10.17345/rcda3051	4	In this article, I argue that a philosophical analysis can achieve a deeper understanding of IWL by helping to identify, assess and compare worldviews reflected in these instruments.

3	Editorial: Geoscience communication – planning to make it publishable	Hillier, J. K.; Welsh, K. E.; Stiller-Reeve, M.; Priestley, R. K.; Roop, H. A.; Lanza, T.; Illingworth, S.	Geoscience Communication	2021	10.5194/gc-4-493-2021	4	Our aim is to help geoscience communicators plan a route to publication and to illustrate how good engagement work that is already being done might be developed into publishable research
3	Impacts of Climate Change on Food Security and Adaptation Options for Smallholder Farmers in Malawi	Twinomugisha, B. B.; Mushy, R. B.	Huria: Journal of the Open University of Tanzania	2021		4	This article is based on the study that assessed the impact of climate change on food security and adaptation strategies among smallholder farmers in Salima district, Malawi.
3	The Implication of REDD+ in Community Forestry (CF) Governance and Local Livelihood: A Case from Nepal	Gautam, D.; Sharma, G.; Sigdel, R.; Basyal, C. R.; Mainali, S.	Contemporary Research: An Interdisciplinary Academic Journal	2021	10.3126/craiaj.v5i1.40480	4	This paper aims to shed lights on the REDD+ effect on community forestry governance, and local livelihood.
1	A Coffee Yield Next-Generation Forecast System for Rain-Fed Plantations: The Case of the Samala Watershed in Guatemala	Pons, D.; Munoz, A.G.; Melendez, L.M.; Chocooj, M.; Gomez, R.; Chourio, X.; Romero, C.G.	Weather And Forecasting	2021	10.1175/WAF-D-20-0133.1	3	In this study, we assessed the climate information demands from coffee farmers and their perception on the climate impacts to coffee yield in the Samalá watershed in Guatemala.
1	The Ecuadorian Banana Farms Managers' Perceptions: Innovation as a Driver of Environmental Sustainability Practices	Ramirez-Orellana, A.; Ruiz-Palomo, D.; Rojo-Ramirez, A.; Burgos-Burgos, J.E.	Agriculture-Basel	2021	10.3390/agriculture11030213	4	This article aims to explore the perceptions of banana farms managers towards environmental sustainability practices through the impact of innovation, adoption of information systems, and training employees through a case study in the province of El Oro (Ecuador).
1	Using diffusion of innovations theory to understand agricultural producer perspectives on cover cropping in the inland Pacific Northwest, USA	Lavoie, A.L.; Dentzman, K.; Wardropper, C.B.	Renewable Agriculture And Food Systems	2021	10.1017/S1742170520000423	4	Cover crops are being promoted across this region as a means to improve agronomic conditions and farmer livelihoods. Yet, there is limited producer-centered social science research to understand the regional and field-level challenges associated with the practice. To address this gap, we draw from the diffusion of innovations theory to examine the perceived relative advantage (the degree to which cover crops are compatible with the current agricultural system), and trialability of cover crops.
1	Transforming Degraded Rangelands and Pastoralists' Livelihoods in Eastern Bhutan	Millar, J.; Tenzing, K.	Mountain Research And Development	2021	10.1659/MRD-JOURNAL-D-21-00025.1	4	This paper describes a 3-year community-based rangeland project in eastern Bhutan aimed at restoring and protecting high-elevation rangelands, including wildlife habitats, grasslands, and watersheds, while improving livelihoods. Herder families (120) of the Brokpa ethnic group participated in group management training, savings schemes, pasture improvement, revegetation, and conservation education.
1	Understanding invasive plant management on family forestlands: An application of protection motivation theory	Clarke, M.; Ma, Z.; Snyder, S.A.; Hennes, E.P.	Journal Of Environmental Management	2021	10.1016/j.jenvman.2021.112161	4	We contribute to the growing literature on invasive plant management and the factors that influence FFOs' likelihood to manage invasive plants on their property by incorporating protection motivation theory (PMT; Rogers 1975).
1	Conservation of Amazonian aquatic mammals	Brum, S.; Rosas-Ribeiro, P.; Amaral, R.D.; de Souza, D.A.; Castello, L.; da Silva, V.M.F.	Aquatic Conservation-Marine And Freshwater Ecosystems	2021	10.1002/aqc.3590	4	This study synthesizes the available information on Amazonian aquatic mammals, including the ecological characteristics of these species, key threats, population status and conservation prospects.
1	Citizens' viewpoints on stormwater Beneficial Management Practices (BMPs) in Brazil	Sousa, B.J.D.; Fialho, H.C.P.; Taffarello, D.; Souza, F.A.A.; Hassanzadeh, E.; Mendiondo, E.M.; de Oliveira, P.T.S.	Journal Of Cleaner Production	2021	10.1016/j.jclepro.2021.129569	4	The objective of this study is to understand the viewpoints of citizens about a set of stormwater BMPs in Brazil.
1	Climate change impact assessment, flood management, and mitigation strategies in Pakistan for sustainable future	Khan, I.; Lei, H.D.; Shah, A.A.; Khan, I.; Muhammad, I.	Environmental Science And Pollution Research	2021	10.1007/s11356-021-12801-4	4	This article is aimed at exploring floods in Pakistan, analyze the adverse effects of floods on humans and the environment, and propose possible sustainable options for the future.
2	Problem solved or problematic? New Zealand aid and dairy development in Sri Lanka	Edwards, J.	New Zealand Journal of Asian Studies	2021		4	This paper explores the perceptions and implications of a New Zealand-funded aid project in Sri Lanka, which is increasing dairy production to improve rural livelihoods.
2	Finance's Social License? Sugar, Farmland and Health	Smith, K.; Lawrence, G.	International journal of health policy and management	2021	10.34172/ijhpm.2021.11	4	This paper examines the exclusion of public health from social license narratives within an increasingly financialised food system, through a case study of foreign ownership in the Australian sugar industry.
2	Co-inoculation With Rhizobacteria and Mycorrhizae Can Improve Wheat/Faba Bean Intercrop Performance Under Field Conditions	Raklami ,A.; Bechtaoui, N.; Tahiri, A.-I.; Slimani, A.; Bargaz, A.; Meddich, A.; Oufdou, K.	Frontiers in Agronomy	2021	10.3389/fagro.2021.734923	4	In this regard, this study aimed to assess the effect of inoculation with beneficial microorganisms on wheat as monocrop or intercrop with faba bean, using four inoculation treatments: (i) inoculation with rhizobacteria, (ii) inoculation with mycorrhizae, (iii) inoculation with the rhizobacteria-mycorrhizae consortium, and (iv) a control treatment consisting of uninoculated plants.
2	An analysis of perceptions, knowledge, and management of rainwater harvesting (RWH) techonologies among agropastoralists in Odwayne District, Somaliland	Jirde, M.; Koech, O.K.; Karuma, A.A.	Tropical and Subtropical Agroecosystems	2021		4	This study, therefore, sought to address this by assessing the differences in socio-economic and institutional attributes among adopters and non-adopters of RWH technologies, the knowledge, and perceptions of agropastoral regarding RWH, while also documenting the existing management and organizational structures for different RWH technologies in Odwayne District, Somaliland.
2	Conservation Agriculture and Climate Resilience: The Case of Christian Care, Gutu District, Zimbabwe	Chitongo, L.	African Renaissance	2021	10.31920/2516-5305/v2021sin1a3	4	The aim of the study is to assess the contribution of the Christian Care conservation programme to food security and its impact on poverty reduction in Zimbabwe.
2	An Acceptance Analysis of Subsoil Amelioration Amongst Agricultural Actors in Two Regions in Germany	Hinzmann, M.; Ittner, S.; Kiresiewa, Z.; Gerdes, H.	Frontiers in Agronomy	2021	10.3389/fagro.2021.660593	4	Therefore, we investigated farmers' and other soil experts' perceptions of subsoil amelioration as an approach to adapt to climate change as well as the factors that influence their willingness to adopt specific measures to improve the subsoil.
2	Cultural Systems in Water Management for Disaster Risk Reduction: The Case of the Ladakh Region	Kandari, S.; Pasupuleti, R.S.; Samaddar, S.;	Journal of Integrated Disaster Risk Management	2021	10.5595/001C.34567	4	This paper investigates how the traditional knowledge and cultural systems of local communities living in the high-altitude cold desert region of the Ladakh region in India have contributed to their water management systems.
2	Bundled Weather Index Insurance Pilot for Drought-Affected Areas in Sri Lanka: Reaching Marginal Farmers	Aheeyar, M.; Samarakoon, K.; de Silva, S.	IWMI Working Papers	2021	10.5337/2021.233	4	This paper assesses the effectiveness of satellite-based weather Index insurance (WII) bundled with real-time climate and agronomic advisory services provided to farmers' mobile phones. The aim is to enhance the drought resilience of diverse groups of farmers by providing solutions and strategies to extend bundled insurance products to more people and address equity issues.

1	Enhancing capacity building to climate adaptation and water conservation among Chinese young people	Mu, L.; Liu, Y.H.; Wang, C.C.; Qu, X.J.; Yu, Y.C.	Environmental Science and Pollution Research	2021	10.1007/s11356-021-12427-6	4	This research presented a water footprint adaptation (WF) approach which attempted to link climate adaptation and capacity development with saving water strategy. The approach was tested in cooperation with two universities in Shaanxi province aiming to develop a starting point for WF evaluation and develop an improvement response.
1	Quantifying the determinants of climate change adaptation strategies and farmers' access to credit in South Africa	Ojo, T.O.; Adetoro, A.A.; Ogundeji, A.A.; Belle, J.A.	Science of the Total Environment	2021	10.1016/j.scitotenv.2021.148499	4	The study estimated the determining factors influencing the adoption of climate change adaptation strategies and credit access among smallholder farmers in the study areas
1	It's Our Fault: A Global Comparison of Different Ways of Explaining Climate Change	Schnegg, M.; O'Brian, C.I.; Sievert, I.J.	Human Ecology	2021	10.1007/s10745-021-00229-w	4	International surveys suggest people increasingly agree the climate is changing and humans are the cause. One reading of this is that people have adopted the scientific point of view. Based on a sample of 28 ethnographic cases we argue that this conclusion might be premature.
1	Farmers' adaptation strategies to combat climate change in drought prone areas in Bangladesh	Anik, A.R.; Rahman, S.; Sarker, J.R.; Al Hasan, M.	International Journal of Distaster Risk Reduction	2021	10.1016/j.ijdrr.2021.102562	4	This paper attempts to investigate farmers' adaptation strategies to combat climate change in drought prone areas and identify their determinants based on a survey of 480 farmers from northwestern Bangladesh.
1	Climate change and food security of South Asia: fresh evidence from a policy perspective using novel empirical analysis	Chandio, A.A.; Jiang, Y.S.; Amin, A.; Ahmad, M.; Akram, W.; Ahmad, F.	Journal of Environmental Planning and Management	2021	10.1080/09640568.2021.1980378	4	This study is the first effort to assess the long-term effects of change in climate on crop production in South Asian countries from 1991 to 2016 by employing the second-generation methods robust to cross-sectional dependence and slope heterogeneity.
2	Social-psychological determinants of farmer intention to adopt nutrient best management practices: Implications for resilient adaptation to climate change	Doran, E.M.B.; Zia, A.; Hurley, S.E.; Tsai, Y.; Koliba, C.; Adair, C.; Schattman, R.E.; Rizzo, D.M.; Méndez, V.E.	Journal of Environmental Management	2020	10.1016/j.jenvman.2020.111304	4	To better understand farmers' management decisions, we test the social-psychological Theory of Planned Behavior (TPB) to determine the relative influence of attitudes, perceived social norms, and perceived behavioral control on adoption of nine NBMPs (Nutrient Best Management Practices).
6	Water-related challenges in nexus governance for sustainable development: Insights from the city of Arequipa, Peru	Salmoral, G.; Zegarra, E.; Vázquez-Rowe, I.; González, F.; del Castillo, L.; Saravia, G.R.; Graves, A.; Rey, D.; Knox, J.W.	Science of the Total Environment	2020	10.1016/j.scitotenv.2020.141114	4	This study explores stakeholder perceptions linked to nexus governance in the context of integrated management of natural resources, particularly water, and the environmental, socio-economic and governance challenges constraining the achievement of UN Sustainable Development Goals (SDGs).
6	Mitigating catastrophic risks and food security threats: Effects of land ownership in Southern Punjab, Pakistan	Jabbar, A.; Wu, Q.; Peng, J.; Sher, A.; Imran, A.; Wang, K.	International Journal of Environmental Research and Public Health	2020	10.3390/ijerph17249258	4	This study explored the role of land tenancy in the adoption of risk management instruments, such as off-farm diversification, improved varieties, and crop insurance.
6	Soil erosion vulnerability and adaptation strategies in maize field of Sindhukhola sub-watershed region, Nepal	Panta, B.; Bhandari, T.; Paudel, B.	SN Applied Sciences	2020	10.1007/s42452-020-03747-2	4	Index ranking method and descriptive statistics were used to rank the perception of farmers pertaining to occurrence, causes and available control measures of erosion.
2	Evaluation of Ecosystem Services Loss Due to Urban Sprawl on Agricultural Land in the Context of Sustainable Development	Vrublova, K.	Journal of Landscape Ecology(Czech Republic)	2020	10.2478/jlecol-2020-0020	4	This paper focuses on the ecosystem services which are provided by agriculture land and on the urban sprawl in the study area of municipality with extended powers Třebíč. The main focus of this article is to evaluate what ecosystem services are provided to Czech society by the agricultural land and assess their financial value and also evaluate which ecosystem services disappear or are limited due to urban sprawl on agricultural land.
2	Risk assessment of irrigation-related soil salinization and sodification in mediterranean areas	Tomaz, A.; Palma, P.; Fialho, S.; Lima, A.; Alvarenga, P.; Potes, M.; Costa, M.J.; Salgado, R.	Water (Switzerland)	2020	10.3390/w12123569	4	In this study, based on key criteria for the assessment of irrigation-related salinization processes (e.g., climate, topography, soil drainage, water quality for irrigation, and crop irrigation method), we developed a methodology for the prediction of soil salinity and sodicity risk in irrigated lands, using two composite indices, the Salinization Risk (RSA) index and the Sodification Risk (RSO) index.
6	The effect of cultural practices and perceptions on global climate change response among Indigenous peoples: A case study on the Tayal people in northern Taiwan	Bayrak, M.M.; Hung, L.-S.; Hsu, Y.-Y.	Environmental Research Letters	2020	10.1088/1748-9326/abcd5c	4	This study explored the effects of culture and local perceptions on coping strategies and adaptations to climate change among Indigenous communities, of which knowledge is inadequate, with a specific focus on two Indigenous Tayal communities in northern Taiwan (N = 101).
6	Climate variation—a perceived drag on rural business performance	Clune, T.; Horta, A.	Sustainability (Switzerland)	2020	10.3390/su122410285	3	This paper reports on the first phase of a multi-stage project that seeks to understand the causes of rural business failure, illustrated through the metaphorical voice of the farmer.
26	Transforming climate science into usable services: The effectiveness of co-production in promoting uptake of climate information by smallholder farmers in Senegal	Chiputwa, B.; Wainaina, P.; Nakelse, T.; Makui, P.; Zougmoré, R.B.; Ndiaye, O.; Minang, P.A.	Climate Services	2020	10.1016/j.cliser.2020.100203	4	This paper assesses the effectiveness of the Multi-disciplinary Working Group (MWG) – a WCIS co-production initiative in Senegal in influencing farmers uptake of weather and climate information (WCI).
2	Understanding farmers' suicidal ideation: a structural equation modeling study in Maharashtra, India	Swami, D.; Dave, P.; Parthasarathy, D.	Climatic Change	2020	10.1007/s10584-020-02935-8	4	Considering the compounding effect of these factors on farmers' suicide, we evaluated and quantified the relationship of individual, community, climatic, credit, and market-oriented factors with adaptation and indebtedness, which were subsequently related to suicidal ideation of farmers.
6	Drivers of farm households' perceived risk sources and factors affecting uptake of mitigation strategies in punjab pakistan: Implications for sustainable agriculture	Iqbal, M.A.; Abbas, A.; Naqvi, S.A.A.; Rizwan, M.; Samie, A.; Ahmed, U.I.	Sustainability (Switzerland)	2020	10.3390/su12239895	3	480 farmers from agriculture-dominated Punjab provinces were randomly selected. The abstract does not mention if they are smallholders.

6	Local perceptions on the state of the pelagic fisheries and fisheries management in Uvira, Lake Tanganyika, DR Congo	De Keyzer, E.L.R.; Masilya Mulungula, P.; Alunga Lufungula, G.; Amisi Manala, C.; Andema Muniali, A.; Bashengezi Cibuhira, P.; Bashonga Bishobibiri, A.; Bashonga Rafiki, A.; Hyangya Lwikitcha, B.; Hugé, J.; Itulamya, C.; Huyghe, C.E.T.; Itulamya Kitungano, C.; Janssens de Bisthoven, L.; Kakogozo Bombi, J.; Kamakune Sabiti, S.; Kiriza Katagata, I.; Kwibe Assani, D.; Lubunga Dunia, P.; Lumami Kapepula, V.; Lwacha, F.; Mazambi Lutete, J.; Shema Muhemura, F.; Milec, L.J.M.; Milenge Kamalebo, H.; Mulimbwa N'Sibula, T.; Mushagalusa Mulega, A.; Muterezi Bukinga, F.; Muzumani Risasi, D.; Mwenyemali Banamwezi, D.; Kahindo N'djungu, J.; Nabintu Bugabanda, N.; Ntakobajira Karani, J.-P.; Raeymaekers, J.A.M.; Riziki Walumona, J.; Safari Rukahusa, R.; Vanhove, M.P.M.; Volckaert, F.A.M.; Wembo Ndeo, O.; Van Steenberge, M.	Journal of Great Lakes Research	2020	10.1016/j.jglr.2020.09.003	4	Knowledge of the perceptions and an understanding of the concerns and struggles of stakeholders of these fisheries can provide policy-makers with recommendations for more suitable fisheries management. We did 1018 interviews with stakeholders, in one close-ended and three semi-open ended surveys.
6	Weather shocks, coping strategies and farmers' income: A case of rural areas of district Multan, Punjab	Hussain, A.; Memon, J.A.; Hanif, S.	Weather and Climate Extremes	2020	10.1016/j.wace.2020.100288	4	This study estimates the impact of weather shocks on farmers' income, followed by the evaluation of their perceptions and coping strategies against weather shocks, in the rural area of district Multan in Pakistani Punjab. The abstract does not mention if they are smallholders.
6	Assessing Environmental Impacts of Sea Bass Cage Farms in Greece and Albania Using Life Cycle Assessment	Konstantinidis, E.; Perdikaris, C.; Gouva, E.; Nathanalides, C.; Bartzanas, T.; Anestis, V.; Ribaj, S.; Tzora, A.; Skoufos, I.	International Journal of Environmental Research	2020	10.1007/s41742-020-00289-8	3	Article about Life-cycle assessment (LCA).
2	Implications of adopting drip irrigation system on crop yield and gender-sensitive issues: The case of Haramaya district, Ethiopia	Dawit, M.; Dinka, M.O.; Leta, O.T.	Journal of Open Innovation: Technology, Market, and Complexity	2020	10.3390/joitmc6040096	4	This study aims at investigating the effects of adopting a drip irrigation system combined with hand-dug wells on crop water productivity and yields of household farmers and their perception on the proposed scheme over two cropping seasons in the Haramaya District, Ethiopia.
6	Valuing Ecosystem Services under Climate Risk: A Case of Recreational Fisheries in the Florida Everglades	Estela Brown, C.; Bhat, M.G.; Rehage, J.	Journal of Water Resources Planning and Management	2020	10.1061/(ASCE)WR.1943-5452.0001290	4	This study aimed to investigate whether users' attitudes toward climate risks have any bearing on how they value ecosystem services and express the desire to mitigate risks. The study used psychometric measures to characterize users' attitudes toward climate risk.
6	Economy-wide impacts of behavioral climate change mitigation: Linking agent-based and computable general equilibrium models	Niamir, L.; Ivanova, O.; Filatova, T.	Environmental Modelling and Software	2020	10.1016/j.envsoft.2020.104839	4	This paper presents a methodology to scale up behavioral changes among heterogeneous individuals regarding energy choices while tracing their macroeconomic and cross-sectoral impacts.
6	Farmers' environmental perceptions and preferences regarding climate change adaptation and mitigation actions	Orduño Torres, M.A.; Kallas, Z.; Ornelas Herrera, S.I.	Land Use Policy	2020	10.1016/j.landusepol.2020.105031	3	This study analyzes farmers' preferences regarding the potential implementation of several mitigation and adaptation actions addressing climate change. Data were collected on 370 farmers in the "Valle del Carrizo" region of northwestern México.
6	Public institutions' capacities regarding climate change adaptation and risk management support in agriculture: the case of Punjab Province, Pakistan	Khan, N.A.; Gao, Q.; Abid, M.	Scientific Reports	2020	10.1038/s41598-020-71011-z	3	This study takes the case of Pakistan to investigate the perspective and capacities of public institutions as well as to identify gaps in current institutional arrangements in dealing and managing climate change in the agriculture sector.
6	Exploring patterns of forest governance quality: Insights from forest frontier communities in Zambia´s Miombo ecoregion	Nansikombi, H.; Fischer, R.; Kabwe, G.; Günter, S.	Land Use Policy	2020	10.1016/j.landusepol.2020.104866	4	Zambia has adopted policies and initiatives to improve forest governance. We use the Governance of Forests Initiatives (GFI) indicator framework from the World Resource Institute in 24 communities in the Miombo ecoregion to examine Zambia´s status in this respect.
6	How collective efficacy makes a difference in responses to water shortage due to climate change in southwest Iran	Pakmehr, S.; Yazdanpanah, M.; Baradaran, M.	Land Use Policy	2020	10.1016/j.landusepol.2020.104798	4	The aim of this research is to accrue empirical evidence about farmers' perceptions of and responses to water shortage due to climate change, using the Protection Motivation Theory. The abstract does not mention if the farmers are smallholders.
6	Climate change resilience and adaption of ethnic minority communities in the upland area in Th?a Thiên-Hu? province, Vietnam	Sem, L.T.H.; Bond, J.; Winkels, A.; Linh, N.H.K.; Dung, N.T.	NJAS - Wageningen Journal of Life Sciences	2020	10.1016/j.njas.2020.100324	4	This study employed FAO's resilience framework to measure household climate change resilience of different ethnic groups and a Poison regression model to identify determinants of household adaptation.
6	Crop and forest pest metawebs shift towards increased linkage and suitability overlap under climate change	Grünig, M.; Mazzi, D.; Calanca, P.; Karger, D.N.; Pellissier, L.	Communications Biology	2020	10.1038/s42003-020-0962-9	4	We investigate potential land-use opportunities arising from climate change for these sectors in Europe, and risks associated with the introduction and establishment of novel insect pests.
16	Determinants of credit constraints and its impact on the adoption of climate change adaptation strategies among rice farmers in South-West Nigeria	Ojo, T.O.; Baiyegunhi, L.J.S.	Journal of Economic Structures	2020	10.1186/s40008-020-00204-6	4	This study analysed the impact of credit constraints on climate change adaptation strategies among smallholder rice farmers in South-West Nigeria.

6	Small island management: a case study of the Smith Island, North Andaman, India	Sridhar, R.; Sachithanandam, V.; Mageswaran, T.; Mahapatra, M.; Badarees, K.O.; Purvaja, R.; Ramesh, R.	Environment, Development and Sustainability	2020	10.1007/s10668-019-00553-8	4	A major challenge in the protection of these small islands is lack of a holistic management plan by the local administration that integrates the special environmental concerns of islands. To address these lacunae, an attempt was made to prepare a small island management plan of Smith Island of North Andaman as a case study.
6	Assessing perceptions of climate risk and adaptation among small farmers in Oregon's Willamette Valley	Roesch-Mcnally G.; Garrett A.; Fery M.;	Renewable Agriculture and Food Systems	2020	10.1017/S1742170519000267	3	Study in Oregon's Southern Willamette Valley, USA.
10	Adaptive capacity of smallholder farmers toward climate change: evidence from Hamadan province in Iran	Jamshidi O.; Asadi, A.; Kalantari, K.; Movahhed Moghaddam, S.; Dadrass Javan, F.; Azadi, H.; Van Passel, S.; Witlox, F.	Climate and Development	2020	10.1080/17565529.2019.1710097	4	This study aimed to examine the adaptive capacity of farmers' household to tolerate climate changes and identify factors affecting the climate in Hamadan province, Iran.
6	Villagization and access to water resources in the Middle Awash Valley of Ethiopia: implications for climate change adaptation	Adnew Degefu, M.; Assen, M.; Satyal, P.; Budds, J.	Climate and Development	2020	10.1080/17565529.2019.1701973	4	The aim of this paper is to evaluate to what extent this phase of villagization has contributed to adaptation strategies among pastoral and agro-pastoral communities, based on an empirical analysis of four villagised sites in the Middle Awash
6	With Power Comes Responsibility – A Rangelands Perspective on Forest Landscape Restoration	Vetter, S.	Frontiers in Sustainable Food Systems	2020	10.3389/fsufs.2020.549483	4	Study about forest and landscape restoration (FLR) .
6	The Sociology of Intra-African Pastoralist Migration: The Case of Tanzania	Awinia, C.S.	Frontiers in Sociology	2020	10.3389/fsoc.2020.518797	4	The study focuses on the relationship between pastoralist migration and climate change, followed by loss of control of epidemics, which can lead to losses of large numbers of livestock.
6	Indigenous science, climate change, and indigenous community building: A framework of foundational perspectives for indigenous community resilience and revitalization	Cajete, G.A.	Sustainability (Switzerland)	2020	10.3390/su12229569	8	This essay presents an overview of foundational considerations and perceptions which collectively form a framework for thinking about Indigenous community building in relationship to the tasks of addressing the real challenges, social issues, and consequences of climate change. The ideas shared are based on a keynote address given by the author at the International Conference on Climate Change, Indigenous Resilience and Local Knowledge Systems: Cross-time and Cross-boundary Perspectives held at the National Taiwan University on 13–14 December 2019.
6	Promoting Mountain Biodiversity through Sustainable Value Chains	Makino, Y.; Geringer, M.; Manuelli, S.	Mountain Research and Development	2020	10.1659/MRD-JOURNAL-D-20-00067.1	4	Study about Mountain biodiversity.
2	Nitrous oxide emissions and nitrogen use efficiency in wheat: Nitrogen fertilization timing and formulation, soil nitrogen, and weather effects	Thilakarathna, S.K.; Hernandez-Ramirez, G.; Puurveen, D.; Kryzanowski, L.; Lohstraeter, G.; Powers, L.-A.; Quan, N.; Tenuta, M.	Soil Science Society of America Journal	2020	10.1002/saj2.20145	4	This study investigated the effects of spring vs. fall N applications of conventional vs. enhanced-efficiency N fertilizers (EENFs) on N2O emissions and N use efficiency in spring wheat (Triticum aestivum L.) over 2.5 yr in Alberta, Canada.
6	Climate emergency adaptation and sustainable management strategies in rural and agricultural landscapes	Nikologianni, A.; Moore, K.; Larkham, P.J.	Infrastructures	2020	10.3390/infrastructures5110097	3	This paper discusses the way in which climate emergency-related strategies and the concepts of climate adaptation, sustainability and governance are being introduced into rural and agricultural landscapes. To investigate environmental impacts on climate change, it uses examples from the 'Landscape Observatory' (Catalonia) and the 'Room for the River' (The Netherlands) landscape programmes.
6	Livelihood vulnerability and adaptation capacity of rice farmers under climate change and environmental pressure on the vietnam mekong delta floodplains	Tran, D.D.; Quang, C.N.X.; Tien, P.D.; Tran, P.G.; Long, P.K.; Van Hoa, H.; Giang, N.N.H.; Há, L.T.T.	Water (Switzerland)	2020	10.3390/w12113282	3	This study evaluated the livelihood sustainability and vulnerability of triple rice farmers on the floodplains of the Vietnam Mekong Delta (VMD).
27	Inuit knowledge of Arctic Terns (Sterna paradisaea) and perspectives on declining abundance in southeastern Hudson Bay, Canada	Henri, D.A.; Martinez-Levasseur, L.M.; Weetaltuk, S.; Mallory, M.L.; Gilchrist, H.G.; Jean-Gagnon, F.	PLoS ONE	2020	10.1371/journal.pone.0242193	4	We conducted individual interviews and a workshop involving 12 Inuit harvesters and elders from Kuujjuaraapik, Nunavik (northern Québec), Canada, to gather their knowledge of Arctic Tern cultural importance, ecology, and stewardship. Interview contributors reported a regional decline in Arctic Tern numbers which appeared in the early 2000s on nesting islands near Kuujjuaraapik.
2	Are the financial markets sensitive to hydrological risk? Evidence from the bovespa	Feria-Domínguez, J.M.; Paneque, P.; de la Piedra, F.	Water (Switzerland)	2020	10.3390/w12113011	3	This research analyzes the BOVESPA stock market response to the worst drought occurred in the last 100 years in Brazil. For this purpose, we conducted a standard event study analysis in order to assess the financial response to such hydrological risk on a sample of seven Brazilian agri-food firms.
6	Determinants of income diversification in flood-prone rural Pakistan	Memon, M.H.; Ali, M.; Khalil, S.	International Journal of Disaster Risk Reduction	2020	10.1016/j.ijdrr.2020.101914	4	Considering income diversification as a risk-spreading livelihood strategy, this study examines the determinants of income diversification in the flood-prone district Dadu in Sindh province of Pakistan.
6	Climate change and farmers' perceptions: impact on rubber farming in the upper Mekong region	Min, S.; Wang, X.; Jin, S.; Waibel, H.; Huang, J.	Climatic Change	2020	10.1007/s10584-020-02876-2	3	This article examines the impact of farmers' perceptions of temperature change on implementing environmentally friendly agriculture practices on rubber plantations. Based on the data collected from 611 smallholder rubber farmers in Xishuangbanna Dai Autonomous Prefecture (XSBN) in the upper Mekong region.
2	Using Bayesian hierarchical modelling to capture cyanobacteria dynamics in Northern European lakes	Mellios, N.K.; Moe, S.J.; Laspidou, C.	Water Research	2020	10.1016/j.watres.2020.116356	4	We model the response of cyanobacteria abundance to variations in lake Total Phosphorus (TP) and Total Nitrogen (TN) concentrations, using a data set from 822 Northern European lakes.
2	Analyzing farmers' drought risk management behavior: Evidence from Iran	Neisi, M.; Bijani, M.; Abbasi, E.; Mahmoudi, H.; Azadi, H.	Journal of Hydrology	2020	10.1016/j.jhydrol.2020.125243	4	The purpose of this study was to "assessing farmers' drought risk management behavior (FDRMB) in downstream of Karkheh Dam basin, Iran". For this purpose, the "protection motivation theory (PMT)" was used to measure FDRMB.
12	Modeling smallholder livestock herders' intentions to adopt climate smart practices: An extended theory of planned behavior	Faisal, M.; Chunping, X.; Akhtar, S.; Raza, M.H.; Khan, M.T.I.; Ajmal, M.A.	Environmental Science and Pollution Research	2020	10.1007/s11356-020-09652-w	4	The current study investigates different psychological factors that affect the small livestock herder's intentions on adopting climate smart practices by using theory of planned behavior (TPB) with additional constructs (moral norms, risk perception, and social attributes).
6	Determinants of household livelihood vulnerabilities to climate change in the himalayan foothills of West Bengal, India	Ghosh, M.; Ghosal, S.	International Journal of Disaster Risk Reduction	2020	10.1016/j.ijdrr.2020.101706	4	Therefore, the aim of the present study is to determine the factors which affect rural household vulnerability in sub-Himalayan West Bengal, India.
6	Whose everyday climate cultures? Environmental subjectivities and invisibility in climate change discourse	Ford, A.; Norgaard, K.M.	Climatic Change	2020	10.1007/s10584-019-02632-1	4	In order to illustrate relationships between social location, culture, and response to climate change, we apply the notion of environmental subjectivities in a secondary analysis of climate engagement in two communities, one of which resembles and one of which lies outside the "mythical" norm.

6	Coherent diffraction imaging for enhanced fault and fracture network characterization	Schwarz, B.; Krawczyk, C.M.	Solid Earth	2020	10.5194/se-11-1891-2020	4	We suggest a largely data-driven framework for the direct imaging of these features by making use of the faint and still often underexplored diffracted portion of the wave field. Finding inspiration in the fields of optics and visual perception, we introduce two different conceptual pathways for coherent diffraction imaging and discuss respective advantages and disadvantages in different contexts of application.
6	Multiple livelihood strategies and high floristic diversity increase the adaptive capacity and resilience of Sri Lankan farming enterprises	Melvani, K.; Bristow, M.; Moles, J.; Crase, B.; Kaestli, M.	Science of the Total Environment	2020	10.1016/j.scitotenv.2020.139120	3	To understand the underlying reasons, traditional farming enterprises in Sri Lanka were explored.
6	Unconventional Sea Surface Temperature Regime Around Japan in the 2000s–2010s: Potential Influences on Major Fisheries Resources	Kuroda, H.; Saito, T.; Kaga, T.; Takasuka, A.; Kamimura, Y.; Furuichi, S.; Nakanowatari, T.	Frontiers in Marine Science	2020	10.3389/fmars.2020.574904	4	Time series of the PDO index has been used to conventionally classify decadal conditions of ocean and fisheries resources around Japan as either warming or cooling regimes. It is now clear that for the 2000s to the mid-2010s, mostly during the “global surface warming slowdown,” the SST regime around Japan was unconventional.
6	Socio-ecological resilience of mangrove-shrimp models under various threats exacerbated from salinity intrusion in coastal area of the Vietnamese Mekong Delta	Nguyen, H.Q.; Tran, D.D.; Luan, P.D.M.H.; Ho, L.H.; Loan, V.T.K.; Anh Ngoc, P.T.; Quang, N.D.; Wyatt, A.; Sea, W.	International Journal of Sustainable Development and World Ecology	2020	10.1080/13504509.2020.1731859	4	We utilized a Motivation and Ability framework in combination with a sustainable livelihood framework to measure the perceived values and resilience of mangrove-shrimp farming systems, based on a broad interview with farmers, scientists, and experts.
6	Human carnivory as a major driver of vertebrate extinction	Coimbra, Z.H.; Gomes-Jr, L.; Fernandez, F.A.S.	Perspectives in Ecology and Conservation	2020	10.1016/j.pecon.2020.10.002	3	We review the anthropogenic threats to 1000 species randomly selected among more than 46,000 vertebrate entries in the IUCN Red List database.
2	Influence of climate variability on soybean yield in matopiba, brazil	Reis, L.; Silva, C.M.S.E.; Bezerra, B.; Mutti, P.; Spyrides, M.H.; Silva, P.; Magalhães, T.; Ferreira, R.; Rodrigues, D.; Andrade, L.	Atmosphere	2020	10.3390/atmos11101130	4	The objective of this study was to analyze the influence of large-scale atmospheric–oceanic mechanisms (El Niño–Southern Oscillation—ENSO and the inter-hemispheric thermal gradient of the Tropical Atlantic) on the spatial–temporal variability of soy yield in MATOPIBA.
6	Integrating ecosystem services into land-use modeling to assess the effects of future land-use strategies in northern ghana	Koo, H.; Kleemann, J.; Fürst, C.	Land	2020	10.3390/land9100379	4	Based on agricultural land-management options that were identified together with the local stakeholders, 75 future land-use strategies as combinations of multiple agricultural practices were elaborated.
6	Spatial and ecological farmer knowledge and decision-making about ecosystem services and biodiversity	Kpienbaareh, D.; Kerr, R.B.; Luginaah, I.; Wang, J.; Lupafya, E.; Dakishoni, L.; Shumba, L.	Land	2020	10.3390/land9100356	4	We explored the synergies between participatory farmer-to-farmer agroecology knowledge sharing, farm-level decisions and their links with macro-level prioritization of conservation strategies.
6	Irrigation influencing farmers' perceptions of temperature and precipitation: A comparative study of two regions of the tibetan plateau	Wang, T.; Yan, J.; Cheng, X.; Yu, Y.	Sustainability (Switzerland)	2020	10.3390/su12198164	3	Respondents were mainly village officials and elderly farmers with knowledge of local conditions, mainly involving infrastructure construction, water supply and disaster situations (e.g., the time of last drought or flood in the village and the number of people affected).
6	Knowledge translation supports community conservation efforts to protect and restore a local marine environment: A case study of Átl'k_a7tsem/Txwnéwu7ts/Howe Sound, British Columbia, Canada	Chapman, J.; Dearden, A.; Miller, A.	Journal of Marine Science and Engineering	2020	10.3390/JMSE8100739	8	Review of articles.
6	Improving china’s resilience to climate-related risks: The china framework for climate services	Wang, Y.; Song, L.; Hewitt, C.; Golding, N.; Huang, Z.	Weather, Climate, and Society	2020	10.1175/WCAS-D-19-0121.1	4	In this paper, the vision, structure, content, and governance of the China Framework for Climate Services, which is designed to respond to these primary needs, is described. This paper reflects on practice, lessons, and experience developing and delivering climate services in China for disaster risk re-duction, agriculture, water, energy, urbanization, and major engineering projects.
6	Determinants of farmers’ adaptation to climate change in rain-fed agriculture of Pakistan	Amir, S.; Saqib, Z.; Khan, M.I.; Ali, A.; Khan, M.A.; Bokhari, S.A.; Zaman-ul-Haq.	Arabian Journal of Geosciences	2020	10.1007/s12517-020-06019-w	3	The study scrutinizes response options and strategies for action. It mainly focuses on the determinants, which characteristically influence the farmers’ decision-making to cope with the looming challenges. The current study was carried out in the rain-fed contextual settings of Chakwal District in Pakistan.
6	Climate change uncertainty among American farmers: an examination of multi-dimensional uncertainty and attitudes towards agricultural adaptation to climate change	Singh, A.S.; Eanes, F.; Prokopy, L.S.	Climatic Change	2020	10.1007/s10584-020-02860-w	3	A large survey of corn farmers in twelve US midwestern states (n = 6849) was used to determine the role of multiple dimensions of uncertainty on prior experience with climate change, attitudes towards climate adaptation, and use of climate outlooks in agricultural decision-making.
6	The strength of green ties: Massachusetts cranberry grower social networks and effects on climate change attitudes and action	Gareau, B.J.; Huang, X.; Pisani Gareau, T.; DiDonato, S.	Climatic Change	2020	10.1007/s10584-020-02808-0	3	Building on the researchers’ analysis of the personal and ecological conditions that affect climate change attitudes among cranberry growers, this paper examines the effect that key actors in the growers’ social networks have on those attitudes.
6	Profitability and perceived resilience benefits of integrated shrimp-tilapia-seaweed aquaculture in North Central Coast, Vietnam	Tran, N.; Cao, Q.L.; Shikuku, K.M.; Phan, T.P.; Banks, L.K.	Marine Policy	2020	10.1016/j.marpol.2020.104153	4	We study the private profitability and farmer perceived resilience effects of adaptation through polyculture of shrimp with mono-sex tilapia in North Central Coast (NCC), Vietnam.
6	From abstract futures to concrete experiences: How does political ideology interact with threat perception to affect climate adaptation decisions?	Schwaller, N.L.; Kelmenson, S.; BenDor, T.K.; Spurlock, D.	Environmental Science and Policy	2020	10.1016/j.envsci.2020.07.001	4	This paper asks, how do political ideologies interact with threat perception to affect coastal climate adaptation decisions? We frame this analysis using the Theory of Planned Behavior (TPB) and Protection Motivation Theory (PMT). Using responses from a survey of residents (n = 164) in North Carolina's (USA) Albemarle-Pamlico Peninsula, we examine how measures of residents’ subjective norms, threat-appraisals, and self-efficacy influence their intent to retreat or topographically adapt.
6	Towards sustaining watershed management practices in Ethiopia: A synthesis of local perception, community participation, adoption and livelihoods	Mengistu, F.; Assefa, E.	Environmental Science and Policy	2020	10.1016/j.envsci.2020.06.019	4	This study examined the nexus of farmers’ perception, participation, livelihoods and their implication for sustaining watershed management program in Ethiopia, case of upper Gibe basin.
6	Between concepts and experiences: understandings of climate change in southern Ecuador	Iniguez-Gallardo, V.; Bride, I.; Tzanopoulos, J.	Public Understanding of Science	2020	10.1177/0963662520936088	4	Through standardised questionnaires and semi-structured interviews conducted in southern Ecuador, this article explores differences between urban and rural dwellers and compares these with farmers’ understandings of the causes, consequences and risks.

11	Comparison of different methods for consideration of multifunctionality of Peruvian dairy cattle in Life Cycle Assessment	Gilardino, A.; Quispe, I.; Pacheco, M.; Bartl, K.	Livestock Science	2020	10.1016/j.livsci.2020.104151	4	The objective of this study was to compare different approaches to cope with multifunctionality of livestock in Life Cycle Assessment (LCA)
6	Do people accurately report droughts? Comparison of instrument-measured and national survey data in Kenya	Linke, A.M.; Witmer, F.D.W.; O'Loughlin, J.	Climatic Change	2020	10.1007/s10584-020-02724-3	3	We evaluate the agreement between drought perceptions of two nationally representative samples of Kenyans (2014 and 2018) and instrument-measured rainfall and vegetation (IMRV) change.
2	Beef value chain analysis and climate change adaptation and investment options in the semi-arid lands of northern Kenya	Ndiritu, S.W.	Journal of Arid Environments	2020	10.1016/j.jaridenv.2020.104216	4	The purpose of this paper is to examine the beef value chain and identify climate change adaptation and investment options in the semi-arid areas of northern Kenya.
6	A (mis)alignment of farmer experience and perceptions of climate change in the U.S. inland Pacific Northwest	Maas, A.; Wardropper, C.; Roesch-McNally, G.; Abatzoglou, J.	Climatic Change	2020	10.1007/s10584-020-02713-6	3	This paper analyzes data from paired surveys (N = 817) and natural variation from baseline weather across the inland Pacific Northwest (iPNW), to determine if long-term, gradual changes in precipitation, and temperature distributions affect farmers' weather perceptions and intentions to adapt.
6	Using experimental manipulation of questionnaire design and a Kenyan panel to test for the reliability of reported perceptions of climate change and adaptation	Munro, A.	Climatic Change	2020	10.1007/s10584-020-02709-2	3	Using an established panel of farmers from across Kenya and a split sample method, I test both the sensitivity of stated perceptions of climate change to question format and the accuracy of recalled adaptations.
6	Bridging the gap between biophysical and social vulnerability in rural India: a community livelihood vulnerability approach	Singh, S.	Area Development and Policy	2020	10.1080/23792949.2020.1734473	4	This study of the nature and extent of livelihood vulnerability of farm households in the Bundelkhand region of Uttar Pradesh, India, involved the computation of livelihood vulnerability indices and indices of exposure, sensitivity and adaptive capacity for different social communities.
6	Experiments in organic theatre	Gopika, S.; Eldhose, A.Y.	Research in Drama Education	2020	10.1080/13569783.2020.1748000	3	This article describes and explains the development of 'organic theatre', a theatre form that blends art and agriculture, developed in Kerala, South India.
2	Dwindling water supply and its socio-economic impact in Sekyere Kumawu District in Ashanti Region of Ghana: public opinion on the role of climate change	Adjei-Mensah, K.; Kusimi, J.M.	GeoJournal	2020	10.1007/s10708-019-10026-0	4	Using in-depth interviews and household surveys of household heads and opinion leaders in the district, the study ascertained public opinion on the role of climate change on dwindling domestic water provision and how inadequate water supply affects the socio-economic lives of people at household level in Sekyere-Kumawu District in Ghana.
6	Quantifying farmers' climate change adaptation strategies and the strategy determinants in Southwest China	Sujakhu, N.M.; Ranjitkar, S.; Yang, H.; Su, Y.; Xu, J.; He, J.	International Journal of Climate Change Strategies and Management	2020	10.1108/IJCCSM-12-2019-0073	3	This paper aims to document the adaptation strategies developed by local farmers to adjust to climate change and related hazards in Lijiang Prefecture in Southwest China, and quantify the determinants of the adaptation measures.
2	Specific climate classification for Mediterranean hydrology and future evolution under Med-CORDEX regional climate model scenarios	Allam, A.; Moussa, R.; Najem, W.; Bocquillon, C.	Hydrology and Earth System Sciences	2020	10.5194/hess-24-4503-2020	4	With multiple studies raising serious concerns about climate shifts and aridity expansion in the region, this one aims to establish a new high-resolution classification for hydrology purposes based on Mediterranean-specific climate indices.
6	Impacts of Natural Disasters on Subjective Vulnerability to Climate Change: A Study of Puerto Rican Fishers' Perceptions after Hurricanes Irma & Maria	Seara, T.; Pollnac, R.; Jakubowski, K.	Coastal Management	2020	10.1080/08920753.2020.1795969	3	In this study, Puerto Rican fishers' perceptions of the effects of climate change on their fishing activity were compared before and after two major hurricanes severely impacted the island in the fall of 2017.
10	Addressing global challenges with unconventional insect ecosystem services: Why should humanity care about insect larvae?	Morimoto, J.	People and Nature	2020	10.1002/pan3.10115	4	In this paper, I first review the traditional ecosystem services primarily attributed to insects, namely edible insects and mass-rearing for biological control. Next, I provide a collection of unconventional ecosystem services provided by insect larvae which highlights the importance of considering life stage-specific services in a holistic view of the ecosystem services framework.
6	Geospatiality of climate change perceptions on coastal regions: A systematic bibliometric analysis	Becerra, M.J.; Pimentel, M.A.; De Souza, E.B.; Tovar, G.I.	Geography and Sustainability	2020	10.1016/j.geosus.2020.09.002	8	In this article, geospatial perception of climate change is identified, and the research parameters are quantified. In addition to investigating the correlations of hotspots on the topic of climate change perception with a focus on coastal communities, Natural Language Processing (NLP) was used to examine the research interactions. A total of 27,138 articles sources from Google Scholar and Scopus were analyzed.
2	"Why would they care?": Youth, resource extraction, and climate change in northern British Columbia, Canada	Sloan Morgan, V.	Canadian Geographer	2020	10.1111/cag.12605	4	This paper explores how rural and remote northern and Indigenous youth engagement and perspectives can transform discussions on climate change and resource extraction. The paper documents how rural and northern youth have been engaged in environmental decision making, particularly in light of resource extraction.
6	Landowner perceptions of woody plants and prescribed fire in the southern plains, usa	Stroman, D.A.; Kreuter, U.P.; Wonkka, C.L.	PLoS ONE	2020	10.1371/journal.pone.0238688	3	In this paper, we report the results of a survey of landowners in the Southern Plains of Texas and Oklahoma in which we asked participants to estimate the current amount of woody plant cover on their land, their preferred amount of woody plant cover and about their perspectives regarding the use of prescribed fire for managing woody plants.
6	The effect of a naturally ventilated roof on the thermal behaviour of a building under mediterranean summer conditions	Ramos, J.; Aires L.;	Journal of Sustainable Development of Energy, Water and Environment Systems	2020	10.13044/j.sdewes.d7.0297	3	The present work aims to assess the impact of natural ventilation of a roof cavity on the thermal environment of a dwelling house under Mediterranean summer conditions.
6	The attractive power of rural destinations and a synergistic community cooperative approach: A	Rainero, C.; Modarelli, G.	Sustainability (Switzerland)	2020	10.3390/su12177233	3	The proposed research work focuses the attention on the analysis of 15 semi-structured interviews through SWOT (strengths, weaknesses, opportunities, and threats) and perception analysis on an event called "Dream of a night... to that town" provided by the Municipality of Colobraro, Basilicata Region (Italy).
11	The integrated socio-perceptual approach: Using ecological mental maps and future imaginaries to understand land use decisions	Sullivan-Wiley, K.; Teller, A.	Global Environmental Change	2020	10.1016/j.gloenvcha.2020.102151	4	Our research takes steps to expand conceptualizations of rural landholders as active and knowledgeable in envisioning, managing, and shaping environmental futures. We design and test a new approach using ecological mental maps and future imaginaries to understand land use practices through a case study in the cocoa-producing and Atlantic Forest region of Southern Bahia, Brazil.
6	Diversity in perception and management of farming risks in southern Mali	Huet, E.K.; Adam, M.; Giller, K.E.; Descheemaeker, K.	Agricultural Systems	2020	10.1016/j.agsy.2020.102905	4	We investigated a broad range of risks that play a role in farmers' decision-making processes.

2	Work adaptations insufficient to address growing heat risk for U.S. agricultural workers	Tigchelaar, M.; Battisti, D.S.; Spector, J.T.	Environmental Research Letters	2020	10.1088/1748-9326/ab86f4	3	Here we estimate the magnitude and spatial patterns of the growing heat exposure and health risk faced by U.S. crop workers and assess the effect of workplace adaptations on mitigating that risk.
2	Interannual climate variation, land type and village livelihood effects on fires in Kalimantan, Indonesia	Santika, T.; Budiharta, S.; Law, E.A.; Dennis, R.A.; Dohong, A.; Struebig, M.J.; Medrilzam; Gunawan, H.; Meijaard, E.; Wilson, K.A.	Global Environmental Change	2020	10.1016/j.gloenvcha.2020.102129	4	Here, we develop a spatially and temporally-explicit typology of fire prevalence across Kalimantan, Indonesia, a region with significant contribution to global greenhouse gas emissions.
6	Does investor attention influence water companies' stock returns?	Piñeiro-Chousa, J.; López-Cabarcos, M.Á.; Ribeiro-Soriano, D.	Technological Forecasting and Social Change	2020	10.1016/j.techfore.2020.120115	3	This paper analyzes how the energy and agriculture industries and the growing environmental awareness of investors influence water companies' stock returns.
6	Farmland abandonment and its determinants in the different ecological villages of the Koshi river basin, central Himalayas: Synergy of high-resolution remote sensing and social surveys	Paudel, B.; Wu, X.; Zhang, Y.; Rai, R.; Liu, L.; Zhang, B.; Khanal, N.R.; Koirala, H.L.; Nepal, P.	Environmental Research	2020	10.1016/j.envres.2020.109711	4	"The abandonment status, its determinants and impact vary by spatial and socioeconomic context. In order to study this important issue, we selected three different villages representing three ecological regions (Mountain, Hill, and Tarai) in the Koshi River Basin (KRB), and applied two methods: the Unmanned Aerial Vehicle (UAV) and a social survey." Climate change perception is mentioned as a leading determinant of farmland abandonment.
6	Climate trends and variability at adaptation scale: Patterns and perceptions in an agricultural region of the Ethiopian Highlands	Ademe, D.; Ziatchik, B.F.; Tesfaye, K.; Simane, B.; Alemayehu, G.; Adgo, E.	Weather and Climate Extremes	2020	10.1016/j.wace.2020.100263	3	This study examines recent climate variability and trends (1981–2016) on Choke Mountain, located in the western Ethiopian Highlands. Through analysis of precipitation and temperature records at monitored locations, we explore observed variability in climate patterns and trends across sites and seasons.
6	Community perception, response and adaptation strategies towards flood risk in a traditional African city	Mashi, S.A.; Inkani, A.I.; Obaro, O.; Asanarimam, A.S.	Natural Hazards	2020	10.1007/s11069-020-04052-2	6	Location: Katsina city of Nigeria
6	Farmers' perception of climate change and adaptation decisions: A micro-level evidence from Bundelkhand Region, India	Singh, S.	Ecological Indicators	2020	10.1016/j.ecolind.2020.106475	4	This paper aims at identifying the key determinants, which influence and motivate farmers to adopt a rational, cost-effective, climate-smart adaptation strategy.
6	Agricultural land use change under climate variability and change: Drivers and impacts	Tahmasebi, T.; Karami, E.; Keshavarz, M.	Journal of Arid Environments	2020	10.1016/j.jaridenv.2020.104202	4	This study aimed to evaluate agricultural land use changes using the case of Eij County, Iran, and determine the perceived drivers and consequences of land use conversion under climate change.
6	Synergy of experts' and farmers' responses in climate-change adaptation planning in Serbia	Stričević, R.; Srdjević, Z.; Lipovac, A.; Prodanović, S.; Petrović-Obradović, O.; Ćosić, M.; Djurović, N.	Ecological Indicators	2020	10.1016/j.ecolind.2020.106481	4	The objective of the paper is to present farmer and expert rankings of potential adaptation measures in Serbia's agriculture, to compare the two perspectives, and to propose priority measures. Twenty-four measures are identified as most appropriate for adaptation to climate change in Serbia.
2	Developing Public-Private Partnerships in Plant Pathology Extension: Case Studies and Opportunities in the United States	Markell, S.G.; Tylka, G.L.; Anderson, E.J.; Van Esse, H.P.	Annual Review of Phytopathology	2020	10.1146/annurev-phyto-030320-041359	4	Study about Public-private partnerships (PPPs) .
6	A bitter pill: smallholder responses to the new green revolution prescriptions in northern Ghana	Vercillo, S.; Weis, T.; Luginaah, I.	International Journal of Sustainable Development and World Ecology	2020	10.1080/13504509.2020.1733702	4	Through a qualitative case study from the Northern Region of Ghana, this paper examines smallholders' perceptions of environmental change and contemporary Green Revolution prescriptions promoted by foreign donors, NGOs and the state.
6	The risky business of water resources management: assessment of the public's risk perception of Oregon's water resources	Hubbard, M.L.	Human and Ecological Risk Assessment	2020	10.1080/10807039.2019.1632167	3	The premise of this study was to assess the Oregon public's risk perception concerning Oregon's water resources. The state has a long-held reputation of having an overabundance of water; however, water shortages, droughts, and impaired water bodies throughout reveal this is not an accurate perception.
6	Measuring rice farmers' risk perceptions and attitude: Evidence from Pakistan	Rizwan, M.; Ping, Q.; Saboor, A.; Ahmed, U.I.; Zhang, D.; Deyi, Z.; Teng, L.	Human and Ecological Risk Assessment	2020	10.1080/10807039.2019.1602753	3	Rice farmers were investigated in Pakistan.
6	Greening and browning trends of vegetation in India and their responses to climatic and non-climatic drivers	Parida, B.R.; Pandey, A.C.; Patel, N.R.	Climate	2020	10.3390/CLI8080092	3	It is imperative to know the spatial distribution of vegetation trends in India and its responses to both climatic and non-climatic drivers because many ecoregions are vulnerable to global climate change. Here we employed the NDVI3g satellite data over the span of 35 years (1981/82-2015) to estimate vegetation trends and corresponding climatic variables trends (i.e., precipitation, temperature, solar radiation and soil moisture) by using the Mann-Kendall test () and the Theil-Sen median trend.
6	Landslide hazard knowledge, risk perception and preparedness in southeast Bangladesh	Alam, E.	Sustainability (Switzerland)	2020	10.3390/SU12166305	4	Article about landslides.
2	Role of information in farmers' response toweather and water related stresses in the lower Bengal Delta, Bangladesh	Kumar, U.; Werners, S.; Roy, S.; Ashraf, S.; Hoang, L.P.; Datta, D.K.; Ludwig, F.	Sustainability (Switzerland)	2020	10.3390/su12166598	4	Our aim was to examine three key research questions: (i) what information is currently available to farmers for agricultural practices and decisionmaking? (ii) what is the perceived quality of the available hydro-climatic information in response to water and weather related stresses? (iii) how does the available information influence farmers' decision-making?
6	Economic and environmental sustainability through green composting: A study among low-income households	Mamun, A.A.; Hayat, N.; Malarvizhi, C.A.N.; Zainol, N.R.B.	Sustainability (Switzerland)	2020	10.3390/su12166488	4	This study intends to examine the intentions and behaviors towards green composting among low-income rural households to generate income, improve agricultural productivity, and reduce dependency on chemical fertilizers.
6	Attitudes of undergraduate students in three Jordanian Universities towards climate change impacts on agriculture and a proposed educational course about climate change	Tahtamouni, R.W.; Danaa, H.; Al-Qudah, T.; Mazahreh, A.; Shibli, R.A.; Haddad, N.; Al-Qudah, T.S.	Fresenius Environmental Bulletin	2020		3	In this study, (250) undergraduate students in three Jordanian public universities have responded to a questionnaire that asses their attitudes toward the climate change impacts on agriculture.
10	Understanding indigenous farming systems in response to climate change: An investigation into soil erosion in the mountainous regions of Central Vietnam	Van Huynh, C.; Pham, T.G.; Nguyen, T.Q.; Nguyen, L.H.K.; Tran, P.T.; Le, Q.N.P.; Nguyen, M.T.H.	Applied Sciences (Switzerland)	2020	10.3390/app10155091	4	The objective of this study is first to estimate the impact of soil erosion risk in these areas, and second to assess the capacity of farming systems which are based on indigenous knowledge (IK) to respond to soil erosion.
10	From spirits to conspiracy? Nomadic perceptions of climate change, pandemics and disease	Stammler, F.M.; Ivanova, A.	Anthropology Today	2020	10.1111/1467-8322.12589	4	This article illustrates how the Yamal-Nenets, a group of reindeer pastoralists in West Siberia, perceive a series of recent natural disasters to be connected to one another through a conspiracy – i.e. caused by the agency of malevolent human forces which are beyond the pastoralists' control.

6	A computational model for soil fertility prediction in ubiquitous agriculture	Helfer, G.A.; Victória Barbosa, J.L.; Santos, R.D.; da Costa, A.B.	Computers and Electronics in Agriculture	2020	10.1016/j.compag.2020.105602	4	The present article proposes an architectural model that evaluates the soil's fertility and productivity through context history with Partial Least Squares Regression.
2	Spatial and temporal evaluation of soil erosion in Turkey under climate change scenarios using the Pan-European Soil Erosion Risk Assessment (PESERA) model	Berberoglu, S.; Cilek, A.; Kirkby, M.; Irvine, B.; Donmez, C.	Environmental Monitoring and Assessment	2020	10.1007/s10661-020-08429-5	3	This study aims to model the soil erosion risk under climate change scenarios in Turkey using the Pan-European Soil Erosion Assessment (PESERA) model, predicting the likely effects of land use/cover and climate change on sediment transport and soil erosion in the country. For this purpose, PESERA was applied to estimate the monthly and annual soil loss for 12 land use/cover types in Turkey.
28	Using local knowledge in emerging infectious disease research	Gaddy, H.G.	Social Science and Medicine	2020	10.1016/j.socscimed.2020.113107	4	This short communication proposes that the ethnobiological knowledge of indigenous and impoverished communities can be a source of information about some of those unknown pathogens. I present the ecological and anthropological theory behind this proposal, followed by a few case studies that serve as a limited proof of concept.
6	Full assessment of Sida (Sida hermaphrodita) biomass as a solid fuel	Jablonowski, N.D.; Kollmann, T.; Meiller, M.; Dohrn, M.; Müller, M.; Nabel, M.; Zapp, P.; Schonhoff, A.; Schrey, S.D.	GCB Bioenergy	2020	10.1111/gcbb.12694	4	Article about biomass for energy in the EU. The perennial herbaceous mallow plant Sida hermaphrodita (L.) Rusby ('Sida') has high potential as an alternative biomass plant for energy purposes.
6	Perception of farmers on climate change and its impacts on agriculture across various altitudinal zones of Bhutan Himalayas	Chhogyel, N.; Kumar, L.; Bajgai, Y.; Hasan, M.K.	International Journal of Environmental Science and Technology	2020	10.1007/s13762-020-02662-8	3	Does not mention being a smallholder.
2	Drought risk assessment for future climate projections in the Nakdong River Basin, Korea	Kim, J.-S.; Park, S.-Y.; Hong, H.-P.; Chen, J.; Choi, S.-J.; Kim, T.-W.; Lee, J.-H.	International Journal of Climatology	2020	10.1002/joc.6473	4	In this study, three general circulation models were selected: IPSL-CM5A-LR, HadGEM2-AO, and CanESM2 as representative scenarios for severe, moderate, and relatively weak droughts to assess the risk of droughts for future climate projections.
6	What is a bad flood? Local perspectives of extreme floods in the Peruvian Amazon	Langill, J.C.; Abizaid, C.	Ambio	2020	10.1007/s13280-019-01278-8	4	The article proposes a more nuanced conceptualization of flooding in riverine Amazonia to better inform policies and practices aimed at supporting local populations during extreme floods.
6	Assessment of climatic variability risks with application of livelihood vulnerability indices	Mukherjee, N.; Siddique, G.	Environment, Development and Sustainability	2020	10.1007/s10668-019-00415-3	4	The study applies vulnerability index models to appraise livelihood vulnerability to climate change of human communities living in coastal fronts of some selected mouzas of Namkhana Block part of the Indian Sundarbans. Primary household surveys (528 households in seven mouzas) are carried out to procure data on indicators of socio-demographic profile, livelihood strategies, health, food, water, social networks, natural disaster and climatic fluctuations.
2	Adversarial super-resolution of climatological wind and solar data	Stengel, K.; Glaws, A.; Hettinger, D.; King, R.N.	Proceedings of the National Academy of Sciences of the United States of America	2020	10.1073/pnas.1918964117	4	We introduce an adversarial deep learning approach to super resolve wind velocity and solar irradiance outputs from global climate models to scales sufficient for renewable energy resource assessment. Using adversarial training to improve the physical and perceptual performance of our networks, we demonstrate up to a 50× resolution enhancement of wind and solar data.
6	Education for the future? Critical evaluation of education for sustainable development goals	Kopnina, H.	Journal of Environmental Education	2020	10.1080/00958964.2019.1710444	4	This article creates greater awareness of the paradoxes of sustainable development and encourages teaching for sustainability through various examples of alternative education that emphasizes planetary ethic and degrowth. The alternatives include Indigenous learning, ecopedagogy, ecocentric education, education for steady-state and circular economy, empowerment and liberation.
6	Emerging Technologies to Enable Sustainable Controlled Environment Agriculture in the Extreme Environments of Middle East-North Africa Coastal Regions	Lefers, R.M.; Tester, M.; Lauersen, K.J.	Frontiers in Plant Science	2020	10.3389/fpls.2020.00801	4	In coastal regions of the Middle East and North Africa (MENA) hold incredible untapped potential for agriculture driven by the combination of key emerging technologies in future greenhouse concepts: transparent infrared collecting solar panels and low energy salt water cooling. These technologies can be combined to create greenhouses that drive regionally relevant agriculture in this extreme environment. The goal of this perspective is to reframe the idea of these environments as extreme, to having incredible untapped development potential.
6	Exploring perceptions and influences of local stakeholders on climate change adaptation in Central and Western Tarai, Nepal	Maharjan S.K.; Maharjan K.L.;	Climate and Development	2020	10.1080/17565529.2019.1664377	3	The local stakeholders in this study are individuals, communities, social groups or institutions/organizations within the local boundaries, who have rights or interests in a system that influences their perceptions and actions. In that sense, local government offices including municipality/rural municipality offices and agricultural, forestry and livestock offices (Public), non-government organizations and community-based organizations, educational institutions, local banks (Private), microfinance and cooperatives (Civic) are part of the local stakeholders.
6	How profitable climate smart agricultural practices are? Voice of farmers from rice-wheat ecologies	Rai, M.; Chand, P.; Kalvaniya, K.C.; Jat, H.S.; Agarwal, T.; Sharma, P.C.; Jat, M.L.	Indian Journal of Agricultural Sciences	2020		4	Farm record keeping can provide a look into the health of farm business, its profitability, and a snapshot in time of its present equity. However, farmers in developing country seldom maintain written records of farm operations. In many cases, farmers consider it worthless exercise. They fee! overwhelmed by record keeping because it takes time, a change in behavior and for some, the requirement to learn a new skill. This study assesses the role of record keeping, particularly among women and youth using data collected in afarmers participatory research undertaken under the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).
6	Consumer Food Waste Behavior among Emerging Adults: Evidence from China	Tsai, W.-C.; Chen, X.; Yang, C.	Foods	2020	10.3390/foods9070961	4	This study focuses on food waste by end consumers and explores factors in the food waste behavior of the emerging adulthood consumer, which can be used as a reference for improving food waste in schools, governments, and other related industries in the future.
29	Determinants of smallholder farmers' adoption of adaptation strategies to climate change in Eastern Tigray National Regional State of Ethiopia	Gebru, G.W.; Ichoku, H.E.; Phil-Eze, P.O.	Heliyon	2020	10.1016/j.heliyon.2020.e04356	4	This paper identified the major adaptation strategies to climate change (CC) and analysed the determinants of adoption of adaptation strategies to climate change in Eastern Tigray Region of Ethiopia.
6	Adaptation strategies of cattle farmers in the dry and sub-humid tropical zones of Benin in the context of climate change	Idrissou, Y.; Assani, A.S.; Baco, M.N.; Yabi, A.J.; Alkoiret Traoré, I.	Heliyon	2020	10.1016/j.heliyon.2020.e04373	4	This study aims at analyzing the adaptation strategies of cattle farmers in the dry tropical zone (DTZ) and sub-humid tropical zone (STZ) of Benin with regard to climate change, as well as the determinants for the choice of these strategies.
6	Challenges and prospects of using treated wastewater to manage water scarcity crises in the Gulf Cooperation Council (GCC) countries	Qureshi, A.S.	Water (Switzerland)	2020	10.3390/w12071971	4	Article about treated wastewater (TWW).
6	Gender matters: Climate change, gender bias, and women's farming in the global south and north	Glazebrook, T.; Noll, S.; Opoku, E.	Agriculture (Switzerland)	2020	10.3390/agriculture10070267	4	Can investing in women's agriculture increase productivity? This paper argues that it can. We assess climate and gender bias impacts on women's production in the global South and North and challenge the male model of agricultural development to argue further that women's farming approaches can be more sustainable.
2	Climate disturbance impact assessment in West Africa: evidence from field survey and satellite imagery analysis	Traore, O.; Chang, W.; Rehman, A.; Traore, S.; Rauf, A.	Environmental Science and Pollution Research	2020	10.1007/s11356-020-08757-6	4	The current research paper has collected important datasets with an objective to assess the impact of extreme drought events on household's livelihoods for better understanding impacts, local people's perception, and the changes on vegetation cover in order to support a robust adaptation strategy to drought.

6	Farmers' perceptions of climate change and adaptation behavior in Wushen Banner, China	Zhang, C.; Jin, J.; Kuang, F.; Ning, J.; Wan, X.; Guan, T.	Environmental Science and Pollution Research	2020	10.1007/s11356-020-09048-w	3	Does not mention being a smallholder. First, the research team selected two towns (Galutu and Wudinghe) based on the town area and the town population size from the six towns in Wushen Banner.
2	Major Climate risks and Adaptation Strategies of Smallholder Farmers in Coastal Bangladesh	Aryal, J.P.; Sapkota, T.B.; Rahut, D.B.; Krupnik, T.J.; Shahrin, S.; Jat, M.L.; Stirling, C.M.	Environmental Management	2020	10.1007/s00267-020-01291-8	4	This study examines major climate risks, farmers' adaptation strategies, and the factors affecting the choice of those strategies using data collected from 630 households in southwestern coastal Bangladesh.
6	The willingness and perception of people regarding green roofs installation	Sarwar, S.; Alsaggaf, M.I.	Environmental Science and Pollution Research	2020	10.1007/s11356-020-08511-y	4	Current research focuses on the willingness and perception of residents regarding the adaptation of green roof technology.
6	Community climate resilience in Cambodia	Jacobson, C.	Environmental Research	2020	10.1016/j.envres.2020.109512	4	This article provides an example of a 27-question framework applied with two Cambodian communes (communities) to assess and understand trends in resilience over time. It is structured around community development outcomes of economic development, environmental quality, infrastructure that matches demands, community self-reliance and capacity to adapt to climate change; it also assesses how inputs and planning contribute to these outcomes.
6	Farmers' awareness level and their perceptions of climate change: A case of Khyber Pakhtunkhwa province, Pakistan	Fahad, S.; Inayat, T.; Wang, J.; Dong, L.; Hu, G.; Khan, S.; Khan, A.	Land Use Policy	2020	10.1016/j.landusepol.2020.104669	3	The abstract does not mention if the farmers are smallholders
6	Perception of threats and related management measures: The case of 32 marine protected areas in West Africa	Failler, P.; Touron-Gardic, G.; Drakeford, B.; Sadio, O.; Traoré, M.-S.	Marine Policy	2020	10.1016/j.marpol.2020.103936	4	This paper presents the results of surveys conducted with managers of West African Marine Protected Areas (MPAs) and focuses on the threats and the extent to which they are taken into account in the management process.
6	National print media vs. agricultural trade publications: communicating the 2012 Midwestern US drought	Church, S.P.; Bentlage, B.; Weiner, R.; Babin, N.; Bulla, B.R.; Fagan, K.; Haigh, T.; Carlton, J.S.; Prokopy, L.S.	Climatic Change	2020	10.1007/s10584-019-02630-3	4	We studied how the elite national press—New York Times (NYT) and Wall Street Journal (WSJ)—covered the 2012 Midwestern drought, how climate change was addressed, and how NYT and WSJ articles differed from each other and agricultural trade publication (ATP) article coverage before, during, and after the drought.
6	On-farm adoption of irrigation technologies in two irrigated valleys in Central Chile: The effect of relative abundance of water resources	Jordán, C.; Speelman, S.	Agricultural Water Management	2020	10.1016/j.agwat.2020.106147	4	This paper examines the adoption of irrigation technologies and the underlying diversity in terms of intensity of adoption in 2 irrigated valleys in Central Chile.
2	Projected spatial patterns in precipitation and air temperature for China's northwest region derived from high-resolution regional climate models	Yin, Z.; Feng, Q.; Yang, L.; Deo, R.C.; Adamowski, J.F.; Wen, X.; Jia, B.; Si, J.	International Journal of Climatology	2020	10.1002/joc.6435	4	Under the CORDEX-EA project, the precipitation and temperature projections (2020–2045) for the economically and socially important region of Northwestern China were derived from high-resolution regional climate model (RCM) simulations for RCP 4.5 and 8.5 scenarios, and compared against a historical period or baseline of 1980–2005.
6	Psychosocial and Socio-Economic Crisis in Bangladesh Due to COVID-19 Pandemic: A Perception-Based Assessment	Bodrud-Doza, M.; Shammi, M.; Bahlman, L.; Islam, A.R.M.T.; Rahman, M.M.	Frontiers in Public Health	2020	10.3389/fpubh.2020.00341	4	The present study intended to conduct a perception-based analysis to get an idea of people's psychosocial and socio-economic crisis, and the possible environmental crisis, amidst the COVID-19 pandemic in Bangladesh.
28	A multidimensional perspective to farmers' decision making determines the adaptation of the farming community	Swami, D.; Parthasarathy, D.	Journal of Environmental Management	2020	10.1016/j.jenvman.2020.110487	4	Our study identifies the factors responsible for increasing inequalities, crop failure and differential decision making capabilities of farmers by surveying 400 farmers in eighteen villages of Maharashtra, India.
6	Perceptions of the seagrass ecosystems for the local communities of Eastern Samar, Philippines: Preliminary results and prospects of blue carbon services	Quevedo, J.M.D.; Uchiyama, Y.; Kohsaka, R.	Ocean and Coastal Management	2020	10.1016/j.ocecoaman.2020.105181	4	This preliminary study investigates the perception of coastal communities in Eastern Samar, Philippines on seagrasses.
6	Social capital reduces vulnerability in rural coastal communities of Solomon Islands	Malherbe, W.; Sauer, W.; Aswani, S.	Ocean and Coastal Management	2020	10.1016/j.ocecoaman.2020.105186	4	This study seeks to measure attributes of social capital in five marine dependent communities of Solomon Islands.
6	Perceptions and exposure to climate events along agricultural value chains: Evidence from Nigeria	Liverpool-Tasie, L.S.O.; Pummel, H.; Tambo, J.A.; Olabisi, L.S.; Osuntade, O.	Journal of Environmental Management	2020	10.1016/j.jenvman.2020.110430	3	This study adopts a value chain perspective to examine climate change perceptions among economic agents all along the maize-poultry value chain in Nigeria.
2	Defining heat waves and extreme heat events using sub-regional meteorological data to maximize benefits of early warning systems to population health	McElroy, S.; Schwarz, L.; Green, H.; Corcos, I.; Guirguis, K.; Gershunov, A.; Benmarhnia, T.	Science of the Total Environment	2020	10.1016/j.scitotenv.2020.137678	3	Using local meteorological data, we identified heat waves and extreme heat events that were associated with the highest burden of excess hospitalizations within the County of San Diego and quantified discrepancies using county-level meteorological criteria.
2	Satellite-based data driven quantification of pluvial floods over Europe under future climatic and socioeconomic changes	Hosseinzadehtalaei, P.; Tabari, H.; Willems, P.	Science of the Total Environment	2020	10.1016/j.scitotenv.2020.137688	4	Here we perform a top-down data driven flood risk assessment for 20-, 30-, 50- and 100-year return periods over Europe at the continental, regional and national levels for the late 21st century. To account for the impact of changes in both climatic and socioeconomic conditions on floods, the Shared Socioeconomic Pathways (SSPs) are merged with Representative Concentration Pathways (RCPs), integrating hazard and several social, economic and agricultural exposure-vulnerability proxy indicators.
6	Examining the willingness to produce organic vegetables in the Bono and Ahafo regions of Ghana	Dapaah Opoku, P.; Bannor, R.K.; Oppong-Kyeremeh, H.	International Journal of Social Economics	2020	10.1108/IJSE-12-2019-0723	4	The purpose of this paper was to analyse the demographic, crop choice, institutional and environmental factors that will influence the vegetable growers in Bono and Ahafo regions of Ghana to produce organic vegetables. The study also assessed the knowledge level of vegetable growers on organic certification processes.
2	Impacts of anthropogenic and climate variation on spatiotemporal pattern of water resources: a case study of Lake Babati, Tanzania	Peter, K.H.; Nnko, H.J.; Mubako, S.	Sustainable Water Resources Management	2020	10.1007/s40899-020-00400-z	4	This study aims to assess the impacts of anthropogenic and climate variation on the spatiotemporal pattern of Lake Babati in Tanzania by establishing physical trends over a period of more than four decades, and evaluate how land use/cover change and climatic variation influenced the pattern.
6	System dynamics applied to terraced agroecosystems: The case study of assaragh (Anti-Atlas Mountains, Morocco)	Boselli, V.; Ouallali, A.; Briak, H.; Houssni, M.; Kassout, J.; El Ouahrani, A.; Michailidi, E.M.	Water (Switzerland)	2020	10.3390/W12061693	4	The main aim of this paper is to introduce a comprehensive multidisciplinary framework that maps the dynamics of the investigated TAS's abandonment, by defining cause-effect relationships on a hydrogeological, ecological and social level, through tools from System Dynamics studies.
6	Rapid emergence and increasing risks of hailstorms: A potential threat to sustainable agriculture in Northern Bangladesh	Raihan, M.L.; Onitsuka, K.; Basu, M.; Shimizu, N.; Hoshino, S.	Sustainability (Switzerland)	2020	10.3390/su12125011	3	This study investigates the recent changes in natural hazard prioritizations in northern Bangladesh and presents community-based risk analyses of the various natural hazards that present threats to sustainable agriculture. The study area in northern Bangladesh included two union council areas under the Panchagarh sub-district.

6	Climate change and public policies in the Brazilian Amazon state of Mato Grosso: Perceptions and challenges	de Mello-Théry, N.A.; de Lima Caldas, E.; Funatsu, B.M.; Arvor, D.; Dubreuil, V.	Sustainability (Switzerland)	2020	10.3390/su12125093	4	This study examines how key stakeholders in agriculture in a number of municipalities in the Brazilian Amazon state of Mato Grosso are incorporating and adapting to public policies on climate change.
10	Dynamics of smallholder farmers' livelihood adaptation decision-making in Central Ethiopia	Etana, D.; Snelder, D.J.R.M.; van Wesenbeeck, C.F.A.; de Cock Buning, T.	Sustainability (Switzerland)	2020	10.3390/su12114526	4	The objective of this study was to investigate the effects of socio-cultural factors, changes in household characteristics, and climate variables on the transition from non-use to use of adaptation strategies.
6	Rural coping and adaptation strategies for climate change by Himalayan communities in Nepal	Dhungana, N.; Silwal, N.; Upadhaya, S.; Khadka, C.; Regmi, S.K.; Joshi, D.; Adhikari, S.	Journal of Mountain Science	2020	10.1007/s11629-019-5616-3	4	This study explored the climate change adaptation and coping strategies that rural communities adopt for the conservation of natural resources and livelihoods in the mid-hills of Nepal.
2	Unprecedented economic attack on Sub-Sahara African economies: coronavirus: How severe is the perceived slump?	Ndiili, N.	Environment Systems and Decisions	2020	10.1007/s10669-020-09780-1	4	This paper postulates the impact of coronavirus on Sub-Saharan African (SSA) economies and resilience to the pandemic.
6	Modeling food growers' perceptions and behavior towards environmental changes and its induced risks: evidence from Pakistan	Khan, N.A.; Gao, Q.; Iqbal, M.A.; Abid, M.	Environmental Science and Pollution Research	2020	10.1007/s11356-020-08341-y	3	This study analyzed the incidence and severity of climate change and its induced risks in the rice-growing region of Pakistan and assessed farmers' perception and attitude by employing risk matrix and Equally Likely Certainty Equivalent model.
2	Ecological risk assessment of surface sediments of Çardak Lagoon along a human disturbance gradient	Kükrer, S.; Erginal, A.E.; Kılıç, Ş.; Bay, Ö.; Akarsu, T.; Öztura, E.	Environmental Monitoring and Assessment	2020	10.1007/s10661-020-08336-9	4	This study aimed to quantify the surface sediment metal distributions of Çardak Lagoon in the Marmara region of Turkey, to characterize their natural and anthropogenic sources and transport mechanisms and to assess their potential ecological risks.
6	Using proverbs to study local perceptions of climate change: a case study in Sierra Nevada (Spain)	Garteizgogeascoa, M.; García-del-Amo, D.; Reyes-García, V.	Regional Environmental Change	2020	10.1007/s10113-020-01646-1	3	We explore whether people recognize and perceive as accurate one type of such forms of oral knowledge, climate-related proverbs. We conducted research in the Alta Alpujarra Occidental, Sierra Nevada, Spain.
6	Seagrass habitat in Tarawa Lagoon, Kiribati: Service benefits and links to national priority issues	Brodie, G.; Brodie, J.; Maata, M.; Peter, M.; Otiawa, T.; Devlin, M.J.	Marine Pollution Bulletin	2020	10.1016/j.marpolbul.2020.111099	3	This paper presents a review around seagrass habitat in Tarawa Lagoon, Kiribati and explores the links between seagrass occurrence and the national priority issues of climate change, urban development, human health, nearshore fisheries, threatened species, ocean policy, research capacity and awareness.
6	Perceptions of governance effectiveness and fisheries restriction options in a climate refugia	McClanahan, T.; Abunge, C.	Biological Conservation	2020	10.1016/j.biocon.2020.108585	4	We evaluated fisher's perceptions of effectiveness of their governance institutions and benefits of restrictions in 16 East African marine fishing communities.
2	Cherry growers' perceived adaption efficacy to climate change and meteorological hazards in northwest China	Song, Z.; Shi, X.	International Journal of Disaster Risk Reduction	2020	10.1016/j.ijdrr.2020.101620	3	Based on the survey data from interviews with cherry growers of 9 villages in Shaanxi Province of China, this study employs the Theory of Planned Behavior and path analysis to identify the factors affecting the degree of perceived adaption efficacy.
26	When climate change is not psychologically distant – Factors influencing the acceptance of sustainable farming practices in the Mekong river Delta of Vietnam	Connor, M.; de Guia, A.H.; Quilloy, R.; Van Nguyen, H.; Gummert, M.; Sander, B.O.	World Development Perspectives	2020	10.1016/j.wdp.2020.100204	2	Study with Rice farmers in the Mekong Delta. The present study, therefore, investigated factors influencing the acceptance of different rice straw management practices.
6	Adaptive capacity and coping strategies of small-scale coastal fisheries to declining fish catches: Insights from Tanzanian communities	Silas, M.O.; Mgeleka, S.S.; Polte, P.; Sköld, M.; Lindborg, R.; de la Torre-Castro, M.; Gullström, M.	Environmental Science and Policy	2020	10.1016/j.envsci.2020.03.012	4	Based on data from official fishery records over a three-decadal period (1984–2016) and recent interviews with artisanal fishermen (319 fishers from eight communities) along the Tanzanian coast, we assessed small-scale fisheries with regard to (i) long-term trends in fishery landings, (ii) long-term alterations in fishing gear use, and (iii) fishers' perceptions on how they have been coping and adapting to fluctuating fish landings. We further investigated (iv) the adaptive capacity of a wide range of coastal villages by assessing the fishers' responses to an anticipated future scenario of a major (50 %) decline in landings from the current fisheries catch levels.
6	Smallholder farmers' perceived evaluation of agricultural drought adaptation technologies used in Uganda: Constraints and opportunities	Mfitumukiza, D.; Barasa, B.; Kiggundu, N.; Nyarwaya, A.; Muzei, J.P.	Journal of Arid Environments	2020	10.1016/j.jaridenv.2020.104137	4	This study assessed the smallholder farmers' perceived evaluation of drought adaptation technologies, constraints and opportunities in drought prone districts of Uganda.
6	Regional fisheries organizations and sustainable development goals 13 and 14: Insights from stakeholders	Haas, B.; Fleming, A.; McGee, J.; Haward, M.	Fisheries Research	2020	10.1016/j.fishres.2020.105529	4	This paper examines the engagement of RFOs with SDG 14 and climate change through an analysis of interviews with 36 RFO stakeholders.
10	Improving dialogue among researchers, local and indigenous peoples and decision-makers to address issues of climate change in the North	Callaghan, T.V.; Kulikova, O.; Rakhmanova, L.; Topp-Jørgensen, E.; Labba, N.; Kuhmanen, L.-A.; Kirpotin, S.; Shaduyko, O.; Burgess, H.; Rautio, A.; Hindshaw, R.S.; Golubyatnikov, L.L.; Marshall, G.J.; Lobanov, A.; Soromotin, A.; Sokolov, A.; Sokolova, N.; Filant, P.; Johansson, M.	Ambio	2020	10.1007/s13280-019-01277-9	3	As local and indigenous peoples, decision-makers and scientists perceive changes and impacts differently and often fail to communicate efficiently to respond to changes adequately, we convened a meeting of the three groups in Salekhard in 2017.
26	Accounting for diverse risk attitudes in measures of risk perceptions: A case study of climate change risk for small-scale citrus farmers in Indonesia	Hasibuan, A.M.; Gregg, D.; Stringer, R.	Land Use Policy	2020	10.1016/j.landusepol.2019.104252	3	The approach presented here draws on a detailed 2017 survey of 500 farmers in rural Indonesia to generate insights into the relationship between risk perceptions and extension services, accessibility of information, and other factors.
6	Understanding farmers' perceptions and adaptation to climate change: the case of Rio das Contas basin, Brazil	de Matos Carlos, S.; da Cunha, D.A.; Pires, M.V.; do Couto-Santos, F.R.	GeoJournal	2020	10.1007/s10708-019-09993-1	3	The vulnerability of the agriculture sector to climate change in developing countries and it's risks to Brazilian Northeast farmers are very discussed issues on environmental agenda. In this sense, this paper put forward an understanding of the factors that drive individuals to adopt adaptive strategies to cope changing environments as a fundamental issue for the direction and effective formulation of well-targeted public policies.
6	Addressing Individual Values to Impact Prudent Antimicrobial Prescribing in Animal Agriculture	Redding, L.E.; Brooks, C.; Georgakakos, C.B.; Habing, G.; Rosenkrantz, L.; Dahlstrom, M.; Plummer, P.J.	Frontiers in Veterinary Science	2020	10.3389/fvets.2020.00297	4	In this article, we draw on lessons learned in other fields (human health care, climate change science) to explore how values could be tied to the extrinsic and intrinsic factors that drive antimicrobial use and prescribing in animal agriculture. We also provide suggestions for ways to build a bridge between the veterinary and social sciences and incorporate values into future research aimed at promoting antimicrobial stewardship in animal agriculture.

6	Supporting climate change adaptation using historical climate analysis	Dorward, P.; Osbahr, H.; Sutcliffe, C.; Mbeche , R.	Climate and Development	2020	10.1080/17565529.2019.1642177	3	We argue that a first step for adaptation projects is to determine the nature of the climate norms and how climate is changing. This paper explores the degree to which development organizations in Kenya, Uganda and Tanzania used analysis of local historical climate information in project aims, planning and design. This included 67 participants, managing 102 community-level climate-related agricultural projects, and three NGO case studies.
6	Exploring local perspectives on the performance of a community-based adaptation project on Aniwa, Vanuatu	Clissold, R.; McNamara, K.E.	Climate and Development	2020	10.1080/17565529.2019.1640656	4	This paper has endeavoured to respond to this gap through evaluating how an adaptation project on Aniwa, Vanuatu reduces people's vulnerability. Drawing from interviews and focus groups conducted across three communities on Aniwa, this study explored local perspectives around the appropriateness, effectiveness, equity and sustainability of the project, as well as impacts on livelihoods assets. S
2	Climate change and its effects on agricultural production in finland – research efforts during the past 50 years	Hakala, K.	Agricultural and Food Science	2020		4	Diversity of production and breeding of heat and flooding tolerant, disease resistant and nutrient-use efficient crop varieties were identified as being crucial for adaptation of agriculture. Efficient water management, measures to limit nutrient leaching and timely control of pests and pathogens are also crucial adaptation measures. Carbon storage in soils and biomass and reduced use of organic fields are suggested to be mitigation measures.
2	Systems thinking on the resource nexus: Modeling and visualisation tools to identify critical interlinkages for resilient and sustainable societies and institutions	Laspidou, C.S.; Mellios, N.K.; Spyropoulou, A.E.; Kofinas, D.T.; Papadopoulou, M.P.	Science of the Total Environment	2020	10.1016/j.scitotenv.2020.137264	4	In this article, we present the structure of a System Dynamics Model—the Nexus_SDM—that maps sector-specific data from major databases (e.g., EUROSTAT) and scenario models (e.g., E3ME-FTT OSeMOSYS and SWIM) for the national case study of Greece.
2	Exoskeleton dissolution with mechanoreceptor damage in larval Dungeness crab related to severity of present-day ocean acidification vertical gradients	Bednaršek, N.; Feely, R.A.; Beck, M.W.; Alin, S.R.; Siedlecki, S.A.; Calosi, P.; Norton, E.L.; Saenger, C.; Štrus, J.; Greeley ,D.; Nezlin, N.P.; Roethler, M.; Spicer, J.I.	Science of the Total Environment	2020	10.1016/j.scitotenv.2020.136610	4	We focused on establishing OA-related vulnerability of larval crustacean based on mineralogical and elemental carapace to external and internal carapace dissolution by using a combination of different methods ranging from scanning electron microscopy, energy dispersive X-ray spectroscopy, elemental mapping and X-ray diffraction.
2	Comparing rainfall erosivity estimation methods using weather radar data for the state of hesse (Germany)	Kreklow, J.; Steinhoff-Knopp, B.; Friedrich, K.; Tetzlaff, B.	Water (Switzerland)	2020	10.3390/w12051424	4	The aim is to assess the impacts of methodology, climate change and input data resolution, quality and spatial extent on the R-factor of the Universal Soil Loss Equation (USLE).
2	Conservation and management challenges facing a medicinal plant Zanthoxylum chalybeum in Simanjiro Area, Northern Tanzania	Mbinile, S.D.; Munishi, L.K.; Ngondya, I.B.; Ndakidemi, P.A.	Sustainability (Switzerland)	2020	10.3390/su12104140	4	The information on the medicinal use, availability, challenges, and future conservation strategies for the medicinal plant Zanthoxylum chalybeum were gathered by using a semi-structured questionnaire, focused group discussions, and field observations in Simanjiro Area, Tanzania.
6	Feasibility of barley straw fibers as reinforcement in fully biobased polyethylene composites: Macro and micro mechanics of the flexural strength	Serra-Parareda, F.; Julián, F.; Espinosa, E.; Rodríguez, A.; Espinach, F.X.; Vilaseca, F.	Molecules	2020	10.3390/molecules25092242	4	In the current investigation, the residue was submitted to thermomechanical process for fiber extraction and individualization.
6	Comparing climate change perceptions and meteorological data in rural West Africa to improve the understanding of household decisions to migrate	De Longueville, F.; Ozer, P.; Gemenne, F.; Henry, S.; Mertz, O.; Nielsen, J.Ø.	Climatic Change	2020	10.1007/s10584-020-02704-7	8	In this paper, we performed a literature review relating to perceptions of climate change and variability in West Africa, followed by an in-depth comparison between perceptions by rural dwellers of Burkina Faso and trends in meteorological data to discuss the importance of perceptions vis-à-vis climate trends in migration decision.
6	The public remain uninformed and wary of climate engineering	Carlisle, D.P.; Feetham, P.M.; Wright, M.J.; Teagle, D.A.H.	Climatic Change	2020	10.1007/s10584-020-02706-5	4	Article about climate engineering approaches.
6	Natural variability or climate change? Stakeholder and citizen perceptions of extreme event attribution	Osaka, S.; Bellamy, R.	Global Environmental Change	2020	10.1016/j.gloenvcha.2020.102070	3	This article uses the case study of the drought and a multi-methods approach to examine perceptions of EEA among key stakeholders and citizens.
6	Socio-cultural perceptions of flood risk and management of a levee system: Applying the Q methodology in the California Delta	Rittelmeyer, P.	Geoforum	2020	10.1016/j.geoforum.2020.02.022	4	This study uses the Q methodology to explore the discourses of the broad range of stakeholders, including farmers, land- and water-based recreation enthusiasts, water exporters, utilities, environmentalists, and government agencies, about flood risk and flood management in the Delta.
6	Understanding farmers' climate adaptation intention in Iran: A protection-motivation extended model	Ghanian, M.; M. Ghoochani, O.; Dehghanpour, M.; Taqipour, M.; Taheri, F.; Cotton, M.	Land Use Policy	2020	10.1016/j.landusepol.2020.104553	4	This study investigates the psychosocial factors that influence farmers' adaptation intention in the critical case of Marvdasht County in Iran – a case that exemplifies agricultural stakeholder decision-making in arid and drought-prone regions.
6	Flood hazards and factors influencing household flood perception and mitigation strategies in Pakistan	Ahmad, D.; Afzal, M.	Environmental Science and Pollution Research	2020	10.1007/s11356-020-08057-z	3	Pakistan has experienced five consecutive floods in the current decade from 2010 to 2015. These floods severely affected the mostly districts of Punjab province among these three most flood-affected districts Rahim Yar Khan, Muzaffargarh, and Rajanpur were selected for this research work. This study used the cross-sectional data of 840 flood-affected households from these three districts.
6	Including indigenous and local knowledge in climate research: an assessment of the opinion of Spanish climate change researchers	García-del-Amo, D.; Mortyn, P.G.; Reyes-García, V.	Climatic Change	2020	10.1007/s10584-019-02628-x	8	In this article, we compare observations of climate change impacts detected by indigenous peoples and local communities from around the world and collected through a literature review (n = 198 case studies) with climate scientists' opinions on the relevance of such information for climate change research.
16	Impacts of the Fomento program on family farmers in the Brazilian semi-arid region and its relevance to climate change: A case study in the region of Sub medio Saõ Francisco [Impactos do Programa de Fomento sobre os Agricultores Familiares do Semiárido Brasileiro e sua relevância frente às mudanc?s climáticas: Um estudo de caso na regiaõ do Submédio Saõ Francisco]	Mesquit, P.; Folhes, R.T.; Cavalcante, L.; De Novais Rodrigues, L.V.; Santos, B.A.; Rodrigues-Filho, S.	Sustentabilidade em Debate	2020	10.18472/SustDeb.v11n1.2020.30505	4	Therefore, given the diversity of impacts of the Fomento Program reported in the literature, this article sought to present results on the perception of the Program's impacts from 28 family farmers, interviewed through qualitative research in four municipalities in the state of Bahia in 2017.
6	Barriers and Strategies to Boost Soil Carbon Sequestration in Agriculture	Demenois, J.; Torquebiau, E.; Arnoult, M.H.; Eglin, T.; Masse, D.; Assouma, M.H.; Blanfort, V.; Chenu, C.; Chapuis-Lardy, L.; Medoc, J.-M.; Sall, S.N.	Frontiers in Sustainable Food Systems	2020	10.3389/fsufs.2020.00037	4	We conducted participatory multi-stakeholder workshops in France and Senegal to collect knowledge and perception of farmers, NGOs, agro-industries, administrations, donors and researchers on barriers and coping strategies for 4 per 1,000 innovations.
6	Technology transfer and adoption for smallholder climate change adaptation: opportunities and challenges	Kuhl, L.;	Climate and Development	2020	10.1080/17565529.2019.1630349	4	This paper empirically examines the technology transfer process for smallholder farmers in Honduras from an adaptation perspective.

2	Understanding individuals' incentives for climate change adaptation in Nicaragua's coffee sector	Bro, A.S.; Ortega, D.L.; Clay, D.C.; Richardson, R.B.	Climate and Development	2020	10.1080/17565529.2019.1619506	4	Using data from discreet choice experiments from Nicaragua, we assess farmers' willingness to change their management practices to improved practices that can help them in their adaptation to climate change. Our results show that coffee producers have heterogeneous preferences and are willing to introduce an additional shade crop and coffee varieties in their farms.
2	Life cycle assessment of autochthonous varieties of wheat and artisanal bread production in Galicia, Spain	Câmara-Salim, I.; Almeida-García, F.; González-García, S.; Romero-Rodríguez, A.; Ruíz-Nogueiras, B.; Pereira-Lorenzo, S.; Feijoo, G.; Moreira, M.T.	Science of the Total Environment	2020	10.1016/j.scitotenv.2020.136720	4	The paper has a twofold perspective to analyse the environmental burdens of wheat cultivation and the bread sector, using life cycle assessment approach: 1) the comparison of the different types of agricultural systems, i.e. the cultivation of Galician wheat following a strategy of monoculture and crop rotation, certified Galician seed production and its comparison with conventional wheat cultivation and 2) the environmental profile of Galician bread.
6	Are Vietnamese farmers able to combat global climate change? A case study on perceptions and attitudes towards sustainable forest management and REDD+ in Central Vietnam	Bayrak, M.M.; Marafa, L.M.	Journal of Sustainable Forestry	2020	10.1080/10549811.2019.1634593	4	This study concerns the implementation of REDD+ among local landscapes and communities in Vietnam.
2	A climate knowledges approach to climate services	Clifford, K.R.; Travis, W.R.; Nordgren, L.T.	Climate Services	2020	10.1016/j.cliser.2020.100155	3	Here we apply findings from in-depth interviews of people whose daily lives interact with climate, weather and a range of natural resources. Study in Colorado's Gunnison Basin.
2	Problems perceived by farmers of north-east India in adopting improved agricultural practices for mitigating the adverse effects of climate change	Kath, S.; Kanagasabapathi, K.	Plant Archives	2020		4	This study aimed to know the problems perceived by farmers in adopting improved agricultural practices for mitigating the adverse effects of climate change
6	Examining harmful algal blooms through a disaster risk management lens: A case study of the 2015 U.S. West Coast domoic acid event	Ekstrom, J.A.; Moore, S.K.; Klinger, T.	Harmful Algae	2020	10.1016/j.hal.2020.101740	4	Study about a massive HAB of Pseudo-nitzschia that was associated with the 2014-16 Northeast Pacific marine heatwave. Here, management actions are examined that were taken by federal and state government agencies and responses of coastal residents to this extreme HAB event using a disaster risk management framework consisting of four phases: 1) prediction and early warning, 2) event response, 3) recovery and reconstruction, and 4) mitigation and prevention.
10	South African national climate change response policy sensitization: An assessment of smallholder farmers in Amathole District Municipality, Eastern Cape Province	Popoola, O.O.; Yusuf, S.F.G.; Monde, N.	Sustainability (Switzerland)	2020	10.3390/su12072616	4	This study, therefore, investigated the level of the policy awareness amongst smallholder farmers in the study area and the sensitization and response implementation.
10	Progress Toward Implementing the Sendai Framework, the Paris Agreement, and the Sustainable Development Goals: Policy from Aotearoa New Zealand	Saunders, W.S.A.; Kelly, S.; Paisley, S.; Clarke, L.B.	International Journal of Disaster Risk Science	2020	10.1007/s13753-020-00269-8	4	The aim of this article is to provide a review of how Aotearoa New Zealand is taking steps to improve consistency of planning across the legislative environment, thereby implementing its commitments to the Sendai Framework, the SDGs, and the Paris Agreement.
6	Probing recent environmental changes and resident perceptions in Upper Himalaya, Nepal	Shrestha, S.; Rahimzadeh-Bajgiran, P.; De Urioste-Stone, S.	Remote Sensing Applications: Society and Environment	2020	10.1016/j.rsase.2020.100315	4	We studied time series of MODIS satellite imagery (2000–2018) to characterize trends in vegetation as well as permanent snow/ice cover in the Upper Mustang Region (UMR) of Nepal and evaluated the relationships between rainfall and MODIS-derived vegetation cover.
6	Determining the influencing factors of biogas technology adoption intention in Pakistan: The moderating role of social media	Wang, Z.; Ali, S.; Akbar, A.; Rasool, F.	International Journal of Environmental Research and Public Health	2020	10.3390/ijerph17072311	4	This study aims to find farmers' intentions of adopting biogas technology in Pakistan by employing the extended norm activation model.
2	Agroecological food web modelling to evaluate and design organic and conventional agricultural systems	Malard, J.J.; Adamowski, J.F.; Rojas Díaz, M.; Nassar, J.B.; Anandaraja, N.; Tuy, H.; Arévalo-Rodriguez, L.A.; Melgar-Quiñonez, H.R.	Ecological Modelling	2020	10.1016/j.ecolmodel.2020.108961	4	In this research, we show that agroecological food web models calibrated with field population dynamics data can be used to demonstrate the mechanisms behind food web dynamics that have been previously observed in the field.
2	Study on the thresholds of grain production risk from climate change in China's main grain-producing areas	Sun, M.; Chou, J.; Xu, Y.; Yang, F.; Li, J.	Physics and Chemistry of the Earth	2020	10.1016/j.pce.2020.102837	4	This paper uses the economic and climate data from 1981 to 2016 in China's main grain-producing areas as its source data. The economic-climate model is combined with the grey model GM(1,1) and the sixth phase of the Coupled Model Intercomparison Project (CMIP6) the second generation Beijing Climate Center Climate System Model (BCC-CSM2-MR) to further explore the impacts of climate change on China's grain production, and to estimated regional differences in China's grain production under different scenarios.
6	Biodiversity, ecology, fisheries, and use and trade of Tetraodontiformes fishes reveal their socio-ecological significance along the tropical Brazilian continental shelf	Eduardo, L.N.; Bertrand, A.; Frédou, T.; Lira, A.S.; Lima, R.S.; Ferreira, B.P.; Menard, F.; Lucena-Frédou, F.	Aquatic Conservation: Marine and Freshwater Ecosystems	2020	10.1002/aqc.3278	4	Tetraodontiformes fishes play a critical role in benthic and demersal communities and are facing threats due to anthropogenic impacts and climate change. However, they are poorly studied worldwide. To improve knowledge on the socio-ecological significance and conservation of Tetraodontiformes a review of literature addressing the diversity, ecology, use and trade, conservation, and main threats of Tetraodontiformes combined with a comprehensive in situ dataset from two broad-range multidisciplinary oceanographic surveys performed along the Tropical Brazilian Continental Shelf was undertaken.
2	Maize farmer preferences for intercropping systems to reduce Striga in Malawi	Silberg, T.R.; Richardson, R.B.; Lopez, M.C.	Food Security	2020	10.1007/s12571-020-01013-2	4	We use discrete choice experiments to identify the trade-offs which Malawian farmers are willing to accept among the attributes of choice scenarios for Striga control practices.
6	Assessment of ecological function indicators related to nitrate under multiple human stressors in a large watershed	Cakir, R.; Sauvage, S.; Gerino, M.; Volk, M.; Sánchez-Pérez, J.M.	Ecological Indicators	2020	10.1016/j.ecolind.2019.106016	4	The objectives of this study are (i) to validate a model that quantifies NR indicator in a reach at a monthly time step in the Garonne watershed; (ii) use this model to quantify NR in all reaches at watershed scale; (iii) to analyze NR spatially and temporally at the reach scale, and finally (iv) to identify drivers influencing NR patterns.
6	Factors determining conversion of agricultural land use in Bangladesh: farmers' perceptions and perspectives of climate change	Islam, M.M.; Jannat, A.; Dhar, A.R.; Ahamed, T.	GeoJournal	2020	10.1007/s10708-018-09966-w	4	The study was accomplished to identify the factors determining land conversion in Bangladesh and evaluate farmers' perception about the changing land use decision.
6	Examining the sustainability and development challenge in agricultural-forest frontiers of the Amazon Basin through the eyes of locals	Blanco-Gutiérrez, I.; Manners, R.; Varela-Ortega, C.; M. Tarquis, A.; G. Martorano, L.; Toledo, M.	Natural Hazards and Earth System Sciences	2020	10.5194/nhess-20-797-2020	4	The development of novel policy strategies that provide balanced solutions, associating economic growth with environmental protection, is still challenging, largely because the perspective of those most affected - local stakeholders - is often ignored. Participatory fuzzy cognitive mapping (FCM) was implemented to examine stakeholder perceptions towards the sustainable development of two agricultural-forest frontier areas in the Bolivian and Brazilian Amazon. A series of development scenarios were explored and applied to stakeholder-derived FCM, with climate change also analysed.

6	Assessing Perception of Climate Change by Representatives of Public Authorities and Designing Coastal Climate Services: Lessons Learnt From French Polynesia	Terorotua, H.; Duvat, V.K.E.; Maspataud, A.; Ouriqua, J.	Frontiers in Marine Science	2020	10.3389/fmars.2020.00160	3	Here, we emphasize their major role in the co-design of tailored coastal climate services (CCS) based on a case study of French Polynesia. In this perspective, we assessed climate change perceptions by public authorities and identified their needs with regard to climate-related science.
6	Toward Comprehensive Plant Microbiome Research	Saikkonen, K.; Nissinen, R.; Helander, M.	Frontiers in Ecology and Evolution	2020	10.3389/fevo.2020.00061	4	We discuss the hot and blind spots in contemporary research on plant microbiomes, and how the latest molecular biological techniques and empirical eco-evolutionary approaches could elevate our perception of microbe–plant interactions through multidisciplinary studies.
2	Determinants of adoption of climate-smart agriculture technologies in rice production in Vietnam	Tran, N.L.D.; Rañola, R.F.; Jr; Ole Sander, B.; Reiner, W.; Nguyen, D.T.; Nong, N.K.N.	International Journal of Climate Change Strategies and Management	2020	10.1108/IJCCSM-01-2019-0003	4	This study aims to examine the determinants of farmers' adoption of these technologies and the effects of their adoption on net rice income (NRI) in three provinces as follows: Thai Binh (North), Ha Tinh (Central) and Bac Lieu (South).
2	Awareness of hydrography courses students on protection of freshwater resources	Yazici, O.	Review of International Geographical Education Online	2020	10.33403/rigeo.634906	3	The aim of this study is to demonstrate the awareness of the students taking Hydrography courses on the conservation of freshwater resources.
2	Climate change vulnerability and perception of different occupational groups of household in the hill regions of Darjeeling district, West Bengal	Basu, J.P.	Indian Journal of Ecology	2020		3	The present paper attempts to measure climate change vulnerability of different occupational groups of households like tea garden labourers, casual labourers, and workers in the informal sector, petty businessmen, tourist guide cum driver and workers in the formal sector in the hill regions of Darjeeling district of West Bengal.
6	Permaculture in Portugal: Social-ecological inventory of a re-ruralizing grassroots movement	Oliveira, H.; Penha-Lopes, G.	European Countryside	2020	10.2478/euco-2020-0002	4	Article about permaculture.
6	Farmers'willingness to pay for index-based livestock insurance in the North West of South Africa	Oduniyi, O.S.; Antwi, M.A.; Tekana, S.S.	Climate	2020	10.3390/cli8030047	4	Article about farmers' willingness to pay.
10	Fuzzy cognitive map clustering to assess local knowledge of ecosystem conservation in Ecuador	Satama, M.; Iglesias, E.	Sustainability (Switzerland)	2020	10.3390/su12062550	4	This paper presents a combined methodology approach based on fuzzy cognitive mapping (FCM) and hierarchical cluster analysis (HCA) to capture perceptions of ecosystem conservation. The purpose was to assess the impact of the "Biocorridors for LivingWell" program on the application of local knowledge by smallholder farmers.
6	Financing climate change mitigation: An assessment of the private sector investment opportunities in Ghana	Ahenkan, A.	Business Strategy and Development	2020	10.1002/bsd2.84	4	The paper examined the investment opportunities in CCM for private firms in Ghana. The study used qualitative research approach through in-depth interviews with 25 private sector organisations, key development partners, and climate change experts and policy makers.
16	Potential of birch (betula pendula roth and b. pubescens ehrh.) for forestry and forest-based industry sector within the changing climatic and socio-economic context ofwestern Europe	Dubois, H.; Verkasalo, E.; Claessens, H.	Forests	2020	10.3390/f11030336	4	This study focuses on the potential of birch (Betula pendula Roth and Betula pubescens Ehrh.), a neglected indigenous species, for forestry and the forest-based industry sector.
6	Farmers' perceptions and adaptation practices to climate change in rain-fed area: A case study from district chakwal, Pakistan	Amir, S.; Saqib, Z.; Khan, M.I.; Khan, M.A.; Bokhari, S.A.; Zaman-Ul-haq, M.; Majid, A.	Pakistan Journal of Agricultural Sciences	2020	10.21162/PAKJAS/19.9030	3	Article does not say it is smallholder.
6	Planning for change? Assessing the integration of climate change and land-based livelihoods in Colorado BLM planning documents	Nave, J.; Knapp, C.N.; McNeeley, S.	Regional Environmental Change	2020	10.1007/s10113-020-01590-0	4	We analyzed Colorado BLM planning documents to evaluate how they are considering climate change, sensitive resources, impacts, and land-based livelihoods in their planning processes using both quantitative word counts and qualitative coding.
6	Small-scale private forest ownership: Understanding female and male forest owners' climate change adaptation behaviour	Pröbstl-Haider, U.; Mostegl, N.M.; Haider, W.	Forest Policy and Economics	2020	10.1016/j.forpol.2020.102111	3	We study the human dimensions of climate change and adaptation of Austrian small-scale private forest owners. The project focused on the human dimensions of climate change and adaptation of Austrian small-scale private forest owners to climate change.
6	Factors Influencing the Adoption of Climate-Smart Agricultural Technologies Among Rice Farmers in Northern Ghana	Zakaria, A.; Alhassan, S.I.; Kuwornu, J.K.M.; Azumah, S.B.; Derkyi, M.A.A.	Earth Systems and Environment	2020	10.1007/s41748-020-00146-w	4	This study examined the factors influencing rice farmers' adoption of these technologies using Multivariate Probit and Poisson regression models. Primary data were collected from 543 rice farmers using a semi-structured questionnaire.
6	Tropical urban parks in Kuala Lumpur, Malaysia: Challenging the attitudes of park management teams towards a more environmentally sustainable approach	Ibrahim, R.; Clayden, A.; Cameron, R.	Urban Forestry and Urban Greening	2020	10.1016/j.ufug.2020.126605	4	The aim is to provide more robust and resilient solutions that expand the contribution of parks to ecosystem service delivery and give greater economic efficiency.
6	Assessment of flood adaptive capacity of urban areas in Thailand	Thanvisitthpon, N.; Shrestha, S.; Pal, I.; Ninsawat, S.; Chaowiwat, W.	Environmental Impact Assessment Review	2020	10.1016/j.eiar.2019.106363	4	This research thus proposes an assessment framework of flood adaptive capacity of urban residents in flood-prone areas. The indicators are based on six components: economic resources, social capital, awareness and training, technology, infrastructure, and institutions and policies.
6	Risk Perceptions and Adaptation to Climate Change and Sea-Level Rise: Insights from General Public Opinion Survey in Florida	Sikder, A.H.M.K.; Mozumder, P.; Prof.	Journal of Water Resources Planning and Management	2020	10.1061/(ASCE)WR.1943-5452.0001156	3	Study in Florida. Thus, understanding public perception and preferences is an important step in addressing the impending risk. In this study, we used an online survey to assess residents' perceptions about the risk of climate change and their views on mitigating potential consequences.
6	A new approach to explain farmers' adoption of climate change mitigation measures	Moerkerken, A.; Blasch, J.; van Beukering, P.; van Well, E.	Climatic Change	2020	10.1007/s10584-019-02595-3	4	This study takes several new angles in investigating farmers' climate change mitigation behaviour. Based on two identical surveys among representative samples of Dutch farmers, this study examines the underlying determinants and motivating factors for three different types of climate change mitigation measures on farms: energy saving, the production of renewable energy and reduction of emissions of methane and nitrous oxide (non-CO2 emissions).
6	Filtering perceptions of climate change and biotechnology: values and views among Colorado farmers and ranchers	Carolan, M.	Climatic Change	2020	10.1007/s10584-019-02625-0	3	Data from a sample (n = 111) of farmers and ranchers located in the US state of Colorado are used to expand our understanding of how food producers process scientific claims.

2	The effects of climate change and groundwater salinity on farmers' income risk	Akbari, M.; Najafi Alamdarlo, H.; Mosavi, S.H.	Ecological Indicators	2020	10.1016/j.ecolind.2019.105893	4	The object of this study was to investigate the effects of temperature, precipitation and groundwater salinity changes on farmer's income risk, water shadow price and economic, social and environmental indicators in Qazvin region. To this purpose, the sensitivity of crop yield to temperature, precipitation and groundwater salinity was estimated by using Response-Yield function and General Maximum Entropy method, then, these variables were predicted for 2030, 2040 and 2050 horizon.
26	Climate change vulnerability and adaptation strategies for smallholder farmers in Yangi Qala District, Takhar, Afghanistan	Omerkhil, N.; Chand, T.; Valente, D.; Alatalo, J.M.; Pandey, R.	Ecological Indicators	2020	10.1016/j.ecolind.2019.105863	4	The present study attempted to evaluate the vulnerability profiles of smallholder farmers due to climate change using the IPCC Framework.
6	The Planning, Implementation, and Evaluation of California's Inaugural Food Waste Prevention Week	Gosliner, W.; Delaney, T.; Caldwell, S.; Lee, J.M.; Billups, N.; Floor, S.	Journal of Public Health Management and Practice	2020	10.1097/PHH.0000000000000896	3	In February 2017, the Nutrition Policy Institute and the Public Health Alliance of Southern California initiated a multisector collaboration among California state agencies to raise awareness about food waste.
6	Comparing farmers' perceptions of climate change with meteorological data in three irrigated cropping zones of Punjab, Pakistan	Imran, M.; Shrestha, R.P.; Datta, A.	Environment, Development and Sustainability	2020	10.1007/s10668-018-0280-2	3	Farmers in Punjab. Article does not say it is smallholder.
6	Multi-stakeholder analysis to improve agricultural water management policy and practice in Malta	D'Agostino, D.; Borg, M.; Hallett, S.H.; Sakrabani, R.S.; Thompson, A.; Papadimitriou, L.; Knox, J.W.	Agricultural Water Management	2020	10.1016/j.agwat.2019.105920	4	In this paper we argue for a transparent process centred on participatory stakeholder engagement to agree on the most challenging water-related risks and to identify solutions that both support the water governance framework and improve on-farm water management practices.
6	Meteorological data and farmers' perception of coastal climate in Bangladesh	Hasan, M.K.; Kumar, L.	Science of the Total Environment	2020	10.1016/j.scitotenv.2019.135384	3	The abstract does not mention if the farmers are smallholders.
6	Choreographic Architecture and Vital Knowledge: Gaëtan Rusquet's Meanwhile	Mattingly, K.	Performance Research	2020	10.1080/13528165.2020.1752573	4	This article places a performance called Meanwhile by Gaëtan Rusquet in conversation with theories of New Materialism and Indigenous epistemologies to analyse how these events contribute to ecological awareness.
2	Understanding the perceptions of sustainable coffee production: A case study of the k'ho ethnic minority in a small village in Lam Dong province of Vietnam	Le, Q.V.; Jovanovic, G.; Le , D.-T.; Cowal, S.	Sustainability (Switzerland)	2020	10.3390/su12031010	4	This case study used anthropological and culture concept methodologies to evaluate the perceptions of sustainable coffee production of the K'Ho ethnic minority in Di Linh district, Lam cng province in the Central Highlands of Vietnam.
6	Exploring farmers' perceptions of agricultural technologies: A case study from Tanzania	Jha, S.; Kaechele, H.; Lana, M.; Amjath-Babu, T.S.; Sieber, S.	Sustainability (Switzerland)	2020	10.3390/su12030998	4	Acknowledging this, the study takes on a case study approach, using the scaling-up assessment (ScalA) method and three focus group discussions with a total of 44 smallholder farmers to systematically and simultaneously assess the sustainability, constraints for adoption, and scaling-up of three AgTs (use of fertilizers, improved seeds, and small-scale irrigation) in Tanzania.
2	Rice farmers' perception of climate variability in south konawe district of Southeast Sulawesi	Saediman, H.; Lasmin, L.O.; Limi, M.A.; Rianse, U.; Geo, L.	International Journal of Scientific and Technology Research	2020		3	This research aimed to find out perception of rice farmers toward climate variability. The study was conducted in Cialam Jaya village, Konda sub-district, South Konawe district, Southeast Sulawesi. Article does not say it is smallholder.
2	Perceptions of the challenges and opportunities of utilising organic waste through urban agriculture in the durban south basin	Menyuka, N.N.; Sibanda, M.; Bob, U.	International Journal of Environmental Research and Public Health	2020	10.3390/ijerph17041158	4	The current paper explores the perceived challenges and opportunities for organic waste utilisation and management through urban agriculture in the Durban South Basin in eThekwini Municipality in KwaZulu-Natal (KZN) Province of South Africa.
6	Evaluation of Adaptation Scenarios for Climate Change Impacts on Agricultural Water Allocation Using Fuzzy MCDM Methods	Zamani, R.; Ali, A.M.A.; Roozbahani, A.	Water Resources Management	2020	10.1007/s11269-020-02486-8	4	In this study, a fuzzy based decision support system has been developed to evaluate and rank the proposed adaptation scenarios to climate change in the Jarreh agricultural water resources system in southwest of Iran
6	Using a qualitative phenomenological approach to inform the etiology and prevention of occupational heat-related injuries in Australia	Hansen, A.L.; Williams, S.; Hanson-easey, S.; Varghese, B.M.; Bi, P.; Heyworth, J.; Nitschke, M.; Rowett, S.; Sim, M.R.; Pisaniello, D.L.	International Journal of Environmental Research and Public Health	2020	10.3390/ijerph17030846	3	Epidemiological evidence has shown an association between exposure to high temperatures and occupational injuries, an issue gaining importance with environmental change. The aim of this study was to better understand contributing risk factors and preventive actions based on personal experiences. Interviews were conducted with 21 workers from five Australian states using a critical phenomenological approach to capture the lived experiences of participants, whilst exploring contextual factors that surround these experiences.
26	Adaptation and development pathways for different types of farmers	Stringer, L.C.; Fraser, E.D.G.; Harris , D.; Lyon, C.; Pereira, L.; Ward ,C.F.M.; Simelton, E.	Environmental Science and Policy	2020	10.1016/j.envsci.2019.10.007	4	This paper identifies several illustrative adaptation and development pathways, recognising the variety of starting points of different types of farmers and the ways their activities intersect with global trends, such as population growth, climate change, rapid urbanisation dietary changes, competing land uses and the emergence of new technologies.
6	Understanding the public's response towards 'enhanced water recovery' in the Great Artesian Basin (Australia) using the carbon capture and storage process	Witt, K.; Ferguson, M.; Ashworth, P.	Hydrogeology Journal	2020	10.1007/s10040-019-02066-0	4	The findings from a series of focus groups held with different stakeholders, including agricultural producers, rural residents, and urban residents, demonstrate how different groups perceived the risks and benefits of injecting CO2 as part of the carbon capture and storage (CCS) process to raise borehole water levels. The paper discusses the trade-offs that the different stakeholder groups found more acceptable.
6	A relational view of climate adaptation in the private sector: How do value chain interactions shape business perceptions of climate risk and adaptive behaviours?	Canevari-Luzardo, L.M.; Berkhout, F.; Pelling, M.	Business Strategy and the Environment	2020	10.1002/bse.2375	3	This paper proposes a novel theoretical framework to explore how business–network dynamics affect risk perceptions and adaptive behaviours in business firms.
6	Partnering with cattle ranchers for forest landscape restoration	Calle, A.	Ambio	2020	10.1007/s13280-019-01224-8	4	To assess ranchers' motivations and limitations for adopting conservation-friendly practices, I surveyed 191 ranchers and extension agents participating in a silvopastoral project in Colombia.
2	HESS Opinions: The myth of groundwater sustainability in Asia	Schwartz, F.W.; Liu, G.; Yu, Z.	Hydrology and Earth System Sciences	2020	10.5194/hess-24-489-2020	4	Article about groundwater.

6	The Azores: A Mid-Atlantic Hotspot for Marine Megafauna Research and Conservation	Afonso, P.; Fontes, J.; Giacomello, E.; Magalhães, M.C.; Martins, H.R.; Morato, T.; Neves, V.; Prieto, R.; Santos, R.S.; Silva, M.A.; Vandeperre, F.	Frontiers in Marine Science	2020	10.3389/fmars.2019.00826	4	We argue that advancing our knowledge and conservation on marine megafauna can and should be capitalized in regions where exceptional access to multiple species (i.e., megafauna 'hotspots') combines with the adequate legal framework, sustainable practices, and research capacity.
6	The importance of information access of cultural values to the principles of sustainable development in climate change	Lawanda, I.I.	Global Knowledge, Memory and Communication	2020	10.1108/GKMC-03-2019-0044	4	This is a methodological proposal that describes the access to information as a starting point, and the importance of access to information as the backbone for the values of investment with the notion of culture as shared beliefs, supported by information to communicate and provide awareness about issues related to environmental policy that is consistent with sustainable development.
6	Prescribed burning in south-eastern Australia: history and future directions	Morgan, G.W.; Tolhurst, K.G.; Poynter, M.W.; Cooper, N.; McGuffog, T.; Ryan, R.; Wouters, M.A.; Stephens, N.; Black, P.; Sheehan, D.; Leeson, P.; Whight, S.; Davey, S.M.	Australian Forestry	2020	10.1080/00049158.2020.1739883	4	This study explores the history of fire in south-eastern Australia, describes the development of prescribed burning as a forest management tool, and discusses the factors that have influenced changes in fire regimes.
2	Floods in contemporary biocentric graphic novels	Curto, G.	Green Letters	2020	10.1080/14688417.2020.1752508	3	This essay examines representations of floods in contemporary graphic novels that follow 1960s and 1970s' popular stories' fascination with the end of days, when climate change awareness was starting to hit the popular consciousness. I demonstrate that Robert Hunter's Map of Days (2013) and Richard McGuire's Here (2014) are paradigmatic updates of climate disaster narratives by introducing 'biocentric' choruses of voices that survive floods, as well emphasising Gaia.
6	Impacts of environmental changes on well-being in indigenous communities in eastern Canada	Fuentes, L.; Asselin, H.; Bélisle, A.C.; Labra, O.	International Journal of Environmental Research and Public Health	2020	10.3390/ijerph17020637	4	We used a questionnaire based on the Environmental Distress Scale (EDS) and the Connor–Davidson Resilience Scale (CD-RISC-10) to examine the impacts of environmental changes on 251 members of four Indigenous communities in the eastern Canadian boreal forest.
6	Edible caterpillars in central Cameroon: host plants, value, harvesting, and availability	Ngute, A.S.K.; Dongmo, M.A.K.; Effa, J.A.M.; Ambombo Onguene, E.M.; Fomekong Lontchi, J.; Cuni-Sanchez, A.	Forests Trees and Livelihoods	2020	10.1080/14728028.2019.1678526	4	Through market surveys, semi-structured interviews and field observations, we identified the edible caterpillars' species commercialized in the Centre region of Cameroon and their host plants, estimated weights and retail values, examined perceptions of change over time, and discussed implications for management.
6	Gender, environment and migration in Bangladesh	Evertsen, K.F.; van der Geest, K.	Climate and Development	2020	10.1080/17565529.2019.1596059	4	This article addresses how gender norms impact the process of migration, and what this means for the use of migration as an adaptation strategy to cope with environmental stressors.
6	Classification of small-scale farmers for improved rainfall variability management in South Africa	Mkuhlani, S.; Crespo, O.; Rusere, F.; Zhou, L.; Francis, J.	Agroecology and Sustainable Food Systems	2020	10.1080/21683565.2018.1537325	4	A study was therefore conducted to improve understanding of rainfall variability management using the farm typology, and snowball and focus group discussion approaches.
6	Climate change awareness, environmental education and gender role burdens among rural farmers of Northern Cross River State, Nigeria	Eneji, C.-V.O.G.A.R.; Onnoghen, N.U.; Acha, J.O.; Diwa, J.B.	International Journal of Climate Change Strategies and Management	2020	10.1108/IJCCSM-06-2020-0070	3	Survey with: farmers, civil servants, Environmental Educators, Agricultural Science teachers, civil servants, Environmental Health workers, staffs of conservation organizations and students from the five local government areas of Bekwarra, Ogoja, Yala, Obudu and Obanliku., all in Cross River State. The abstract does not mention if they are smallholders.
2	From climate data to actionable climate knowledge: Dost-pagasa experience providing climate services to smallholder farmers in calapan, oriental mindoro	Cinco, T.; Agustin, W.; Cooper, B.; Declaro, A.; de Guzman, R.; Juanillo, E.; Marasigan, R.; Solis, A.; Hayman, P.	Philippine Agricultural Scientist	2020		4	Communicating weather and climate information for farm decision-making remains a challenge for hydro-meteorological agencies, including the Philippine agency DOST-PAGASA. Through stakeholder engagements with smallholder farmers in Calapan, Oriental Mindoro, three possible root causes were identified: a lack of awareness and accessibility to information, the misinterpretation of probabilistic seasonal forecast and drought categories, and an inadequate understanding of local climate change implications. In this paper, we describe a series of steps to address these barriers.
2	Assessing Perceptions of the Households-heads Regarding Food Security Status in Drought-hit Areas of District Tharparkar, Sindh, Pakistan: A Case Study for Agricultural Extension	Shah, N.A.; Ashraf, E.; Shurjeel, H.K.; ud Din Mirani, Z.; Rafique, U.; Shah, R.A.	Sarhad Journal of Agriculture	2020	10.17582/journal.sja/2020/36.4.1162.1173	4	The purpose of this study was to assess the perceptions of the respondents for ongoing food security status in the district of Tharparkar, Sindh-Pakistan and to highlight the role of extension service delivery organizations in the area.
2	A new hotspot for temminck's red colobus (piliocolobus badius temminckii) in the Gambia: The feasibility of a community approach to conservation	Mayhew, M.; Fenton, L.; Dittrich, A.; Armstrong, R.; Cramer, J.D.	Primate Conservation	2020		3	The geographic range and abundance of Temminck's red colobus, Piliocolobus badius temminckii, in The Gambia is not well documented. In March 2019, line transect surveys were conducted at a number of data deficient forests in The Gambia to establish species presence or absence, contribute to a greater understanding of the species at a national scale and identify priority sites for conservation.
16	Research, Development and Capacity Building for Food and Nutrition Security in Sub-Saharan Africa	Jideani, A.I.O.	International Journal of Food Studies	2020	10.7455/ijfs/9.2.2020.a1	4	This paper focuses on research, development and capacity building in relation to food and nutrition security (FNS) in sub-Saharan Africa (SSA).
2	Insect decline: Immediate action is needed [Le déclin des Insectes: Il est urgent d'agir]	Jactel, H.; Imler, J.-L.; Lambrechts, L.; Failloux, A.-B.; Lebreton, J.D.; Le Maho, Y.; Duplessy, J.-C.; Cossart, P.; Grandcolas, P.	Comptes Rendus - Biologies	2020	10.5802/CRBIOL.37	4	Insects appeared more than 400 million years ago and they represent the richest and most diverse taxonomic group with several million species. Yet, under the combined effect of the loss of natural habitats, the intensification of agriculture with massive use of pesticides, global warming and biological invasions, insects show alarming signs of decline.
6	Analysing the challenges in implementing Vietnam's Nationally-Determined Contribution (NDC) in the agriculture sector under the current legal, regulatory and policy environment	Trung, N.D.; Thang, N.T.; Anh, L.H.; Babu, T.S.A.; Sebastian, L.	Cogent Environmental Science	2020	10.1080/23311843.2020.1792670	4	This study analyses the current supporting laws, regulations, strategies, national action plans, NDCs, scientific literature and other documents and policies in Vietnam to identify the barriers against the effective implementation of mitigation and adaptation agriculture activities committed in Vietnam's NDC.
6	Sustainability responses to climate-smart adaptation in Africa: implication for food security among farm households in the Central Region of Ghana	Dadzie, S.K.N.; Inkoom, E.W.; Akaba, S.; Annor-Frempong, F.; Afful, J.	African Journal of Economic and Management Studies	2020	10.1108/AJEMS-04-2019-0155	4	The study examined the sustainability responses to climate-smart adaptation and the implication it has for explaining the food security situations among farm households in the Central Region of Ghana.

27	Integrating local indigenous knowledge to enhance risk reduction and adaptation strategies to drought and climate variability: The plight of smallholder farmers in Chirumhanzu district, Zimbabwe	Grey, M.S.; Masunungure, C.; Manyani, A.	Jamba: Journal of Disaster Risk Studies	2020	10.4102/JAMBA.V12I1.924	4	This article focuses on drought risk reduction and climate change adaptation strategies adopted by rural households to sustain their livelihood activities.
2	Are farmer perceptions among significant determinants of adoption of agricultural diversity in malawi? A case of Lilongwe district	Fatch, P.; Masangano, C.; Kamoto, J.F.M.; Jordan, I.; Hilger, T.; Mambo, I.; Kalimbira, A.; Nuppenau, E.-A.	Journal of Agriculture and Rural Development in the Tropics and Subtropics	2020	10.17170/kobra-202011262276	4	This study was conducted in Lilongwe District of Malawi to identify factors influencing adoption of agricultural diversity and particularly to test if farmer perceptions were among significant determinants of adoption of agricultural diversity.
6	Resilience applied to farming: Organic farmers' perspectives	Perrin, A.; Milestad, R.; Martin, G.	Ecology and Society	2020	10.5751/ES-11897-250405	4	Our objectives in this study were to highlight farmers' perceptions of farm resilience to the variety of disturbances they have to cope with in their daily farm management and to highlight resilience factors. We conducted 128 semistructured interviews on French organic dairy cattle (85) and sheep (43) farms.
6	Cross-scale risk perception: Differences between tribal leaders and resource managers in arctic alaska	Blair, B.; Kofinas, G.P.	Ecology and Society	2020	10.5751/ES-11776-250409	4	To assess these differences, we surveyed North Slope Iñupiat tribal leaders and Alaska State and U.S. federal resource management professionals about perceived risks to North Slope community sustainability.
10	"Like the plains people losing the buffalo": Perceptions of climate changimpacts, fisheries management, and adaptation actions by Indigenous peoples in coastal British Columbia, Canada	Whitney, C.K.; Frid, A.; Edgar, B.K.; Walkus, J.; Siwallace, P.; Siwallace, I.L.; Ban, N.C.	Ecology and Society	2020	10.5751/ES-12027-250433	4	Through a collaborative partnership with four First Nations and their umbrella organization for technical support, we examined people's perceptions of social and ecological aspects of adaptation to climate change.
2	Underlying drivers that influence farmers sustainable adaptation strategies	Akhtar, R.; Masud, M.M.; Uddin, M.D.; Adnan Hye, Q.M.	International Journal of Management and Sustainability	2020	10.18488/journal.11.2020.93.181.193	4	This study explores what the main determinants are for farmers when choosing specific adaptation strategies in the context of local climate.
2	Strengthening climate resilience and women's networks: Brazilian inspiration from agroecology	Feitosa, C.; Yamaoka, M.	Gender and Development	2020	10.1080/13552074.2020.1840149	4	This article analyses the social, economic, and environmental effects that a gender approach can bring to agroecological adaptation projects, with particular attention to women's roles in their communities and beyond. The analysis is based on two agroecological projects in Brazil: Adapta Sertão and the Yarang Women's Movement.
2	Vulnerability of agriculture to climate change in serbia - farmers' assessment of impacts and damages	Stricevic, R.J.; Lipovac, A.D.; Prodanovic, S.A.; Ristovski, M.A.; Petrovic Obradovic, O.T.; Durovic, N.L.j.; Durovic, D.B.	Journal of Agricultural Sciences (Belgrade)	2020	10.2298/JAS2003263S	3	The objective of this research is to assess the vulnerability of agriculture in Serbia to climate change, based on farmers' perceptions. Article does not say it is smallholder.
6	Local people's perceptions about Land Use Cover Change (LULCC) for sustainable human wellbeing in Namibia	Haindongo, P.N.; Kalumba, A.M.; Orimoloye, I.R.	GeoJournal	2020	10.1007/s10708-020-10337-7	4	This study investigated local people's perception of LULCC in the Kavango River Basin of Namibia.
6	A balanced perspective on the importance of extensive ruminant production for human nutrition and livelihoods and its contribution to greenhouse gas emissions	Scholtz, M.M.; Neser, F.W.C.; Makgahlela, M.L.	South African Journal of Science	2020	10.17159/sajs.2020/8192	3	Article about ruminants.
6	Feedback modelling of the impacts of drought: A case study in coffee production systems in Viet Nam	Pham, Y.; Reardon-Smith, K.; Mushtaq, S.; Deo, R.C.	Climate Risk Management	2020	10.1016/j.crm.2020.100255	2	In this paper, we apply causal loop modelling grounded in systems thinking theory to examine the interdependencies and feedback processes among factors associated with drought that impact crop production using a case study of Robusta coffee production systems in Viet Nam – the world's second-largest coffee producing country.
2	Community Group networking on the Community-based Adaptation measure in Tapak Village, Semarang coastal area	Septiarani, B.; Handayani, W.	Indonesian Journal of Geography	2020	10.22146/IJG.39053	4	Scope area of this research is Tapak Village which regarded as a pilot area of CBA implementation in Semarang. Stakeholders mapping and social network analysis was used to visualizing the community interaction in their adaptation measures.
6	Unwrapping the memory box: Gendered livelihoods in a forest community in the Sundarbans, Bangladesh	Roy, S.; Zafarullah, H.; Das, A.K.	Asian Journal of Social Science	2020	10.1163/15685314-04803010	4	Considering the impacts of cyclones Aila and Sidr, this autoethnographic study closely examines the long-established perceptions of women and men about the resources of the Sundarbans.
6	Farmer forecasts: Impacts of seasonal rainfall expectations on agricultural decision-making in Sub-Saharan Africa	Guido, Z.; Zimmer, A.; Lopus, S.; Hannah, C.; Gower, D.; Waldman, K.; Krell, N.; Sheffield, J.; Caylor, K.; Evans, T.	Climate Risk Management	2020	10.1016/j.crm.2020.100247	3	Farmers' expectations of future rainfall would therefore seem to be critical determinants of agricultural outcomes and foreshadow climate impacts. However, few studies have quantified the linkages between on-farm decisions and farmer seasonal predictions. We report on detailed household and phone surveys of 501 smallholder farmers in central Kenya based on the 2018 growing seasons and expectations for the 2019 March-April-May growing season.
6	Infrastructure for water security: Coping with risks in rural Kenya	Hamlet, L.C.; Kamui, M.M.; Kaminsky, J.	Journal of Water Sanitation and Hygiene for Development	2020	10.2166/washdev.2020.038	4	By uniquely combining protection motivation theory and photovoice, we explore water infrastructure's function in rural Kenyan households' perception and mitigation of water-related risk.
2	Environmental impact assessment of thai minced fish paste (Surimi) using life cycle assessment methodology	Usubharatana, P.; Phungrassami, H.	Environmental Research, Engineering and Management	2020	10.5755/j01.erem.76.3.21928	4	Here, the environmental impact of Thai surimi production was estimated based on life cycle assessment (LCA) methodology, focusing specifically on two Thai surimi products made from goatfish and ponyfish caught within the southern region of Thailand.
2	Climate change impacts on staple root and tuber crops production: Implications for smallholder farmers' livelihoods in rural Ghana	Owusu, K.; Obour, P.B.; Oppong, R.; Boadi, S.A.	International Journal of Sustainable Society	2020	10.1504/IJSSOC.2020.109771	4	This study investigated evidence of climate change impacts on cassava and yam production and its implications on smallholder farmers' livelihood in the Jaman South District of Ghana.
6	Income stabilization tool in viticulture – Risk management innovation: The case of the Istria county [Osiguranje dohotka u vinogradarstvu – Inovacija za upravljanje rizikom: Slu?aj Istarske županije]	Čop, T.. Čehić, A.; Njavro, M.	Journal of Central European Agriculture	2020	10.5513/JCEA01/21.3.2758	4	Qualitative research on the small sample was applied with the goal to explore attributes that could impact the selection of IST.

16	Research priorities and future directions in conservation of wild orchids in Sri Lanka: A review	Dananjaya Kottawa-Arachchi, J.; Samantha Gunasekara, R.	Nature Conservation Research	2020	10.24189/ncr.2020.029	4	Article abour orchids.
2	Local issues and perspectives: The role of federal government's intervention in the minority Fulani herdsmen and majority local farmers' crisis in Nigeria	Bamidele, S.	International Journal on Minority and Group Rights	2020	10.1163/15718115-02703001	4	This article illuminates the contradictory perceptions among the main stakeholders in Nigeria and global world on the trajectory of the Fulani herdsmen insurgency stage. The article contends that the farmers' and herdsmen's clashes are substantially a war of perceptions on the progress made thus far. This broadening divergence in perception will result in making a long-term stabilisation strategy difficult.
6	Dynamics of socio-economic factors affecting climate vulnerability and technology adoption: Evidence from jodhpur district of Rajasthan	Singh, N.P.; Srivastava, S.K.; Sharma, S.; Anand, B.; Singh, S.; Ranjith, P.C.	Indian Journal of Traditional Knowledge	2020		4	The paper investigates socio-economic factors affecting vulnerability and adoption of innovations using micro-level survey data of 100 systematically selected farmers in the Jodhpur district of Rajasthan, India.
2	Farmers' expectations, effects, and preferences of adaptation approaches used in the eastern cape province to ease climate variability	Mdoda, L.	Journal of Human Ecology	2020	10.31901/24566608.2020/70.1-3.3222	4	This study is to investigate emerging growers' insights of weather variation and its hostile consequences', classify main adaptation approaches used by farmers and investigate the features that impact of selecting mitigation approach by emerging growers in the Eastern Cape Province.
2	The effects of climate change on rural livestock farming: Evidence from Limpopo Province, South Africa	Maluleke, W.; Tshabalala, N.P.; Barkhuizen, J.	Asian Journal of Agriculture and Rural Development	2020	10.18488/journal.ajard.2020.102.645.658	3	The objective of this study is to identify the perceptions of the conspicuous rural livestock farmers as well as the officials from the Department of Agriculture, Forestry and Fisheries (DAFF) on the effects of climate change on rural livestock farming practices.
2	An assessment of farmers' awareness level regarding integrated farming system in District Sargodha, Punjab, Pakistan	Ashraf, E.; Shurjeel, H.K.; Sadaf, S.; Ahmad, A.; Rafique, U.; Javed, M.A.	Sarhad Journal of Agriculture	2020	10.17582/JOURNAL.SJA/2020/36.3.913.923	4	Purpose of the study was to assess the awareness of the farmers to determine the impact of integrated farming system (IFS) on agricultural development and improving the livelihoods in the study area.
2	Comparative global warming potential as environment protection criteria of production systems: A case study of philippine chicken meat sector	Espino, M.T.M.; Bellotindos, L.M.	Applied Environmental Research	2020	10.35762/AER.2020.42.2.2	4	This study aimed to demonstrate the identification, evaluation and comparison of the environmental impacts of Philippine chicken meat production systems.
6	Towards smart dairy nutrition: Improving sustainability and economics of dairy production	Schönleben, M.; Mentschel, J.; Strelec, L.	Czech Journal of Animal Science	2020	10.17221/16/2020-CJASq	4	The objectives of this study were: 1) to assess the influential parameters which govern neutral detergent fibre rumen degradability of corn silage, using a set of 584 corn silages from multiple years, and 2) to evaluate within an integrated dairy production set up the economic and ecological improvement potential by feeding a subset of 28 different corn silages, including detailed variety information.
2	Farming production analysis of seaweed and farmer’s perception towards climate change effect in Southeast Sulawesi, Indonesia	Geo, L.O.; Halim; Ariani, W.O.R.	Pakistan Journal of Biological Sciences	2020	10.3923/pjbs.2020.1004.1009	4	This study was to know the income of seaweed in Southeast Sulawesi and the coping strategy of climate change effect.
6	Gender and climate change linkages in the semi-arid region of Ghana	Mensah, M.; Vlek, P.L.G.; Fosu-Mensah, B.Y.	GeoJournal	2020	10.1007/s10708-020-10261-w	4	This research investigates gender difference and gender-specific adaptation strategies to climate change and variability.
2	Observations and perceptions of veterinarians and farmers on heartwater distribution, occurrence and associated factors in South Africa	Leask, R.; Bath, G.F.	Journal of the South African Veterinary Association	2020	10.4102/jsava.v91i0.1763	3	The objective was to determine whether climatic changes or other epidemiological factors influence the occurence of heartwater in South Africa. A survey was conducted to scrutinise these factors using both veterinarians and farmers working in known areas in which heartwater had previously been confirmed to establish the value of each of these factors.
6	Factors affecting farmers' perception and adaptation behavior in response to climate change in Hamedan province, Iran	Momtaz, A.M.; Choobchian, S.; Farhadian, H.	Journal of Agricultural Science and Technology	2020		6	Location: Hamedan Province, Iran.
2	Barriers to climate change adaptation: Insights from the sundarbans mangrove-based fisheries of bangladesh	Islam, M.; Rahman, A.; Paul, B.; Khan, M.I.	Asian Fisheries Science	2020	10.33997/j.afs.2020.33.2.008	4	This study identified barriers to climate change adaptation faced by fishing communities dependent on the Sundarbans mangroves. The study also explored the possible linkages among the different barriers for the adaptation to climate change and ways to overcome them.
6	Strategies use by garlic growers in coping with climate variability in Occidental Mindoro, Philippines	Declaro-Ruedas, M.Y.A.	Journal of Agricultural Extension	2020	10.4314/jae.v24i2.5	4	The study determined garlic grower's perception on livelihoods' vulnerability to climate variability, the coping strategies employed, and the relationship between the profile and their coping mechanism to climate variability. Correlational research design was employed in this study.
10	Perceptions of occupational heat, sun exposure, and health risk prevention: A qualitative study of forestry workers in South Africa	Rother, H.-A.; John, J.; Wright, C.Y.; Irlam, J.; Oosthuizen, R.; Garland, R.M.	Atmosphere	2020	10.3390/ATMOS11010037	4	This study examined the perceptions of occupational heat and sun exposure and health risk prevention among forestry workers removing alien invasive vegetation in the Western Cape, South Africa.
6	Combating climate change-induced heat stress: Assessing cool roofs and its impact on the indoor ambient temperature of the households in the Urban slums of Ahmedabad	Vellingiri, S.; Dutta, P.; Singh, S.; Sathish, L.; Pingle, S.; Brahmbhatt, B.	Indian Journal of Occupational and Environmental Medicine	2020	10.4103/ijoem.IJOEM_120_19	4	The present study conducted to identify the efficient cool roof technologies that reduce indoor temperature of the households and improve the heat resilience of dwellings located in the urban slums of Ahmedabad.
6	Inventing the Grand Banks: A deep chart: Humanities GIS, Cartesian, and literary perceptions of the north-west Atlantic fishery ca 1500–1800	Travis, C.; Ludlow, F.; Matthews, A.; Lougheed, K.; Rankin, K.; Allaire, B.; Legg, R.; Hayes P.; Nicholls, J.; Towns, L.; Holm, P.	Geo: Geography and Environment	2020	10.1002/geo2.85	4	Article about Grand Banks. Grand Banks was “properly a mountain, hid under water,” and noted its cod population “seems to equal that of the grains of sand which cover this bank.”
2	The smallholder farmers' perceptions of climate variability impact on rice production and the case of adaptation strategies in Banteay Meanchey, (BMC), Cambodia	Thangrak, V.; Somboonsuke, B.; Sdoodee, S.; Darnsawasdi, R.; Voe, P.	International Journal of Agricultural Technology	2020		4	The objectives were aimed to determine the farmers’ perceptions of climate variability impact on rice productions, and proposed a set of adaptation strategies for rice farming for development in Banteay Mean Chey Province, Cambodia.
6	Revitalizing cultivation and strengthening the seed systems of fonio and Bambara groundnut in Mali through a community biodiversity management approach	Sidibé, A.; Meldrum, G.; Coulibaly, H.; Padulosi, S.; Traore, I.; Diawara, G.; Sangaré, A.R.; Mbosso, C.	Plant Genetic Resources: Characterisation and Utilisation	2020	10.1017/S1479262120000076	4	Article about fonio and Bambara. Fonio (Digitaria exilis (Kippist) Stapf) and Bambara groundnut (Vigna subterranea (L.) Verdc.) are native crops grown at a small scale in Mali that have potential to support agricultural productivity under climate change.

2	Climate-smart agriculture and smallholder farmers' income: The case of soil conservation practice-adoption at qamata irrigation scheme, South Africa	Ighodaro, I.D.; Mushunje, A.; Lewu, B.F.; Omoruyi, B.E.	Journal of Human Ecology	2020	10.31901/24566608.2020/69.1-3.3207	4	This paper evaluates the influence of the adoption of climate-smart agricultural (CSA) practices on smallholder farmers' overall income, using the case of soil conservation practice-adoption at Qamata Irrigation Scheme (QIS), South Africa.
2	An assessment of effects of climate change on human lives in context of local response to agricultural production in district buner	Naz, R.; Shah, M.; Ullah, A.; Alam, I.; Khan, Y.	Sarhad Journal of Agriculture	2020	10.17582/journal.sja/2020/36.1.110.119	4	The study entitled "an assessment of effects of climate change on human lives in context of local response to agricultural production was conducted in District Buner-Pakistan. Tehsil Gagra, out of the six tehsils of district Bunir, constituted the universe of the study.The conceptual framework comprised of two study variables i. e "agriculture production" and "climate change effects on human life".
2	Influence of socio-economic stressors on interpretations of climate change on Takuu Atoll, Papua New Guinea	Moesinger, A.	Journal de la Societe des Oceanistes	2020	10.4000/jso.11312	4	The paper discusses the three main environmental changes observed by local residents, namely increasingly unpredictable weather patterns, shoreline erosion, and increasing salinisation of garden plots.
6	Determinants of the adoption of climate-smart agricultural practices by small-scale farming households in King Cetshwayo district municipality, South Africa	Abegunde, V.O.; Sibanda, M.; Obi, A.	Sustainability (Switzerland)	2020	10.3390/SU12010195	4	Article about Climate-smart agriculture (CSA).
6	Climate change risk perception among agriculture students: The role of knowledge, environmental attitude, and belief in happening	Zobeidi, T.; Yazdanpanah, M.; Bakhshi, A.	Journal of Agricultural Science and Technology	2020		3	The study sample consisted of 320 undergraduate studentswho were selected through random sampling.
6	Credibility aspects of research-based gaming in science communication-the case of The Maladaptation Game	Asplund, T.	Journal of Science Communication	2020	10.22323/2.19010201	4	The study analyses agricultural stakeholders' discussions on the credibility of scientific descriptions in The Maladaptation Game - a game based on research on climate change maladaptation in Nordic agriculture
6	Perception of environmental spillovers across scale in climate change adaptation planning: The case of small-scale farmers' irrigation strategies, Kenya	Elijah, V.T.; Odiyo, J.O.	Climate	2020	10.3390/cli8010003	4	Few if any policy assessments and research efforts have been directed at investigating how farmer perceptions mediate spillovers from the ubiquitous irrigation adaptation strategy. In this study, the cognitive failure and/or bias construct is examined and proposed as an analytical lens in research, policy, and learning and the convergence of disaster risk reduction and climate change adaptation discourse
2	Water quality trading mechanism enhances willingness to upgrade rural household septic systems in the western lake erie basin, Northwest Ohio	Guo, Y.; Mancl, K.; Moore, R.	Journal of Environmental Health	2020		4	The objective of this study was to explore the possibility of expanding the use of WQT from agriculture to rural septic systems, an often-neglected nonpoint source of nutrients to Lake Erie.
6	Assessing indigenous knowledge through farmers' perception and adaptation to climate change in Pakistan	Ali, M.F.; Ashfaq, M.; Hassan, S.; Ullah, R.	Polish Journal of Environmental Studies	2020	10.15244/pjoes/85194	6	Location: Punjab. The present study tries to fill this gap and emphasizes the realization of the importance of need and transmission of modern scientific knowledge to local communities. So, the broader objective was to examine farmers' perceptions about climate change and other environmental issues through their indigenous knowledge. For this purpose, data was collected by interviewing 386 farmers from three different agro-ecological zones of Punjab Province, Pakistan.
6	Climate change adaptation in Semi-Arid Ecosystems: A case study from Ghana	Yomo, M.; Villamor, G.B.; Aziadekey, M.; Olorunfemi, F.; Mourad, K.A.	Climate Risk Management	2020	10.1016/j.crm.2019.100206	4	This paper investigated the role of local institutions in facilitating farm households' response and adaptation to climate change impacts on their livelihood
6	Visualizing climate change adaptation: An effective tool for agricultural outreach?	Schattman, R.E.; Hurley, S.E.; Greenleaf, H.L.; Niles, M.T.; Caswell, M.	Weather, Climate, and Society	2020	10.1175/WCAS-D-19-0049.1	4	This study examines the potential of PVZs to engage agricultural stakeholders about climate change adaptation, specifically around best management practices (BMPs).
6	Human relationships with domestic and other animals: One health, one welfare, one biology	Tarazona, A.M.; Ceballos, M.C.; Broom, D.M.	Animals	2020	10.3390/ani10010043	4	The concepts of one health, one welfare, and one biology are discussed as a background to driving global change.
6	Winds of change for farmers: Matches and mismatches between experiences, views and the intention to act	Peltonen-Sainio, P.; Sorvali, J.; Kaseva, J.	Climate Risk Management	2020	10.1016/j.crm.2019.100205	4	To gain some insight into farmers' decision making and to identify possible hotspots that require knowledge sharing, encouragement and subsidies, a farmer survey was arranged. 38,091 invitations were sent covering 80% of Finnish farmers and 4401 answers were received without significant distortions of representativeness due to age, geographical area, farm type, farm size or education.
2	Hybrid infrastructures, hybrid governance: New evidence from Nairobi (Kenya) on green-blue-grey infrastructure in informal settlements: "Urban hydroclimatic risks in the 21st century: Integrating engineering, natural, physical and social sciences to build resilience"	Mulligan, J.; Bukachi, V.; Clause, J.C.; Jewell, R.; Kirimi, F.; Odbert, C.	Anthropocene	2020	10.1016/j.ancene.2019.100227	4	This paper reports the benefits and limitations of implementing and managing local green, blue and grey infrastructure solutions in an urban informal setting. We studied ten completed public space projects that featured urban drainage infrastructure in the informal neighborhood of Kibera, Nairobi.
6	Views from the dock: Warming waters, adaptation, and the future of Maine's lobster fishery	McClenachan, L.; Scyphers, S.; Grabowski, J.H.	Ambio	2020	10.1007/s13280-019-01156-3	3	Our research focused on active Maine lobster fishers, with the goal of interviewing across a broad range of backgrounds and experiences. Interviewees were identified through organizations involved in the Maine lobster industry such as the Maine Lobstermen's Association.
6	Techno-Optimism and Farmers' Attitudes Toward Climate Change Adaptation	Gardezi, M.; Arbuckle, J.G.	Environment and Behavior	2020	10.1177/0013916518793482	3	Here we examine (a) whether techno-optimism is found among Midwestern corn and soybean farmers and (b) how this confidence in human ingenuity influences their support for climate change adaptation.
6	Gender and climate risk management: evidence of climate information use in Ghana	Partey, S.T.; Dakorah, A.D.; Zougmoré, R.B.; Ouédraogo, M.; Nyasimi, M.; Nikoi, G.K.; Huyer, S.	Climatic Change	2020	10.1007/s10584-018-2239-6	3	The study was carried out at the Lawra-Jirapa Districts of the Upper West Region of Ghana where downscaled seasonal forecast information through mobile phone technologies (Esoko platform) had been disseminated to farmers since 2011.
6	Stakeholder awareness of climate adaptation in the commercial seaport sector: A case study from Ireland	O'Keeffe, J.M.; Cummins, V.; Devoy, R.J.N.; Lyons, D.; Gault, J.	Marine Policy	2020	10.1016/j.marpol.2016.04.044	3	The specific objectives of this paper are to establish the readiness of the seaport sector in Ireland to build adaptive capacity to respond to climate change and to assess lessons from and for Ireland in the context of international best practice.
1	Crop wild relatives of the United States require urgent conservation action	Khoury, C.K.; Carver, D.; Greene, S.L.; Williams, K.A.; Achicanoy, H.A.; Schori, M.; Leon, B.; Wiersema, J.H.; Frances, A.	Proceedings Of The National Academy Of Sciences Of The United States Of America	2020	10.1073/pnas.2007029117	4	"To determine conservation priorities for these plants, we developed a national inventory, compiled occurrence information, modeled potential distributions, and conducted threat assessments and conservation gap analyses for 600 native taxa." Crop wilds relatives

1	The role of interest in climate change instruction	Carman, J.; Zint, M.; Burkett, E.; Ibanez, I.	Science Education	2020	10.1002/sce.21610	3	"We conducted two consecutive quasi-experimental studies that investigated the role of interest in predicting middle school students' knowledge gains from a unit about how scientists use mathematical models to predict climate change's impacts on forests."
1	An Assessment of How Australian Fisheries Management Plans Account for Climate Change Impacts	Fogarty, H.E.; Cyitanovic, C.; Hobday, A.J.; Pecl, G.T.	Frontiers In Marine Science	2020	10.3389/fmars.2020.591642	4	"Here, we determine the extent to which Australian state fisheries management documents consider issues relating to climate change, as well as how frequently climate change is considered a research funding priority within fisheries research in Australia."
1	Hail Climatology Along the Northeastern Adriatic	Jelic, D.; Megyeri, O.A.; Malecic, B.; Vozila, A.B.; Mahovic, N.S.; Prtenjak, M.T.	Journal Of Geophysical Research-Atmospheres	2020	10.1029/2020JD032749	4	"To contribute to this field, we determined the hail climatology in the northeastern (NE) Adriatic region and analyzed its spatial and temporal patterns and performed an objectively derived weather type analysis of ERA5 daily mean data and instability indices."
1	Crop insurance: A barrier to conservation adoption?	Fleckenstein, M.; Lythgoe, A.; Lu, J.Y.; Thompson, N.; Doering, O.; Harden, S.; Getson, J.M.; Prokopy, L.	Journal Of Environmental Management	2020	10.1016/j.jenvman.2020.111223	4	"Using a mixed methods approach, we conducted semi-structured interviews and a multi-state survey to determine if crop insurance requirements limit cover crops and/or conservation tillage adoption for Midwest corn producers."
1	A classification scheme to determine wildfires from the satellite record in the cool grasslands of southern Canada: considerations for fire occurrence modelling and warning criteria	Thompson, D.K.; Morrison, K.	Natural Hazards And Earth System Sciences	2020	10.5194/nhess-20-3439-2020	4	"Daily polar-orbiting satellite MODIS thermal detections since 2002 were used as the baseline for quantifying wildfire activity in the mixed grass and agricultural lands of southernmost central Canada."
1	Farmer's behavior in pesticide use: Insights study from smallholder and intensive agricultural farms in Bangladesh	Ali, M.P.; Kabir, M.M.M.; Haque, S.S.; Qin, X.H.; Nasrin, S.; Landis, D.; Holmquist, B.; Ahmed, N.	Science Of The Total Environment	2020	10.1016/j.scitotenv.2020.141160	4	"We conducted a broad analysis on the effects of knowledge and awareness of farmers as well as the influence of the different associated stakeholders such as pesticide retailers and the government, on farmers' behavior in pesticide use from a detailed survey of 917 agricultural households in different regions of Bangladesh."
1	Understanding characteristics of forest professionals and small woodlot owners for communicating climate change adaptation	Soucy, A.; De Urioste-Stone, S.; Rahimzadeh-Bajgiran, P.; Weiskittel, A.; McGreavy, B.	Trees Forests And People	2020	10.1016/j.tfp.2020.100036	3	"We conducted an online survey of two forestry groups in Maine, U.S., classified as (1) forest professionals, and (2) small woodlot owners."
1	Indigenous climate adaptation sovereignty in a Zimbabwean agro-pastoral system: exploring definitions of sustainability success using a participatory agent-based model	Eitzel, M.V.; Solera, J.; Wilson, K.B.; Neves, K.; Fisher, A.C.; Veski, A.; Omoju, O.E.; Ndlovu, A.M.; Hove, E.M.	Ecology And Society	2020	10.5751/ES-11946-250413	4	"Using the Zimbabwe Agro-Pastoral Management Model (a community-based ABM cocreated with farmer-researchers in Mazvihwa Communal Area), we explored how different definitions of sustainability affected the conclusions from the model, including average annual harvest and the persistence of resources (livestock, harvest, and woodland biomass) in the modeled system above minimum thresholds."
1	Dimensions of changing perception towards wildlife conservation in East Siang district of Arunachal Pradesh, Eastern Himalayas	Jyrwa, J.D.; Joshi, B.D.; Ghosh, A.; Mayi, Y.; Nipa, M.; Anga, N.; Pali, M.; Thakur, M.; Chandra, K.; Sharma, L.K.	Global Ecology And Conservation	2020	10.1016/j.gecco.2020.e01265	4	"Perception towards the wildlife conservation of locals determines the future of conservation programs, hence we assessed the perception of forest communities in East Siang district towards wildlife conservation in their surroundings."
1	Using stakeholders' preference for ecosystems and ecosystem services as an economic basis underlying strategic conservation planning	Ureta, J.C.; Vassalos, M.; Motallebi, M.; Baldwin, R.; Ureta, J.	Heliyon	2020	10.1016/j.heliyon.2020.e05827	4	"Using an online survey, we elicited South Carolina residents' preference in prioritizing the target ecosystems and ecosystem services in the state."
1	Comparisons between ethnooceanographic predictions by fishermen and official weather forecast in Brazil	Alves, L.D.; Di Beneditto, A.P.M.; Ghisolfi, R.D.; Quaresma, V.D.; Zappes, C.A.	Ocean & Coastal Management	2020	10.1016/j.ocecoaman.2020.105347	4	"In this sense, the aim of the present study is to compare ethnooceanographic predictions from artisanal fishermen from the northern coast of Rio de Janeiro State, southeastern Brazil, with the official meteorological forecast from Brazilian institutes, identifying which one is more used by fishermen for their safety on board."
1	Frequent Flooding and Perceived Adaptive Capacity of Subarctic Kashechewan First Nation, Canada	Khalafzai, M.A.K.; McGee, T.K.; Parlee, B.	Arctic	2020	10.14430/arctic71586	4	"This article assesses the perceived adaptive capacity of the Kashechewan First Nation, located in the flood-prone southwestern James Bay (Subarctic) region in Canada."
1	The politics of decarbonization: Examining conservative partisanship and differential support for climate change science and renewable energy in Utah	Hazboun, S.O.; Howe, P.D.; Coppock, D.L.; Givens, J.E.	Energy Research & Social Science	2020	10.1016/j.erss.2020.101769	3	"We examine the role of partisanship and partisan identity in individuals' stances toward climate change, renewable energy, and policy using a mixed methods approach including survey data (n = 1508) and semi-structured interviews of political conservatives (n = 26)."
1	Energy justice from the bottom up: A capability approach to community acceptance of wind energy in Mexico	Velasco-Herrejon, P.; Bauwens, T.	Energy Research & Social Science	2020	10.1016/j.erss.2020.101711	4	"This paper aims to extend the energy justice framework by using the capability approach to understand factors affecting community acceptance of energy technologies."
1	Global land grab: Toward a country typology for future land negotiations	Petrescu, D.C.; Hartel, T.; Petrescu-Mag, R.M.	Land Use Policy	2020	10.1016/j.landusepol.2020.104960	4	"The present study aims to advance the understanding of how the outcome of large land negotiations at the global level is influenced by country characteristics."
1	Delivering an enabling environment and multiple benefits for land degradation neutrality: Stakeholder perceptions and progress	Allen, C.; Metternicht, G.; Verburg, P.; Akhtar-Schuster, M.; da Cunha, M.I.; Santivanez, M.S.	Environmental Science & Policy	2020	10.1016/j.envsci.2020.07.029	4	"This paper summarises the results from a global survey of LDN stakeholders, and a review of national progress in target setting that was commissioned by the United Nations Convention to Combat Desertification (UNCCD) in 2018." LDN= land degradation neutrality
1	Perceptions of and responses to coastal erosion risks: The case of Cotonou in Benin	de Longueville, F.; Hountondji, Y.C.; Assogba, L.; Henry, S.; Ozer, P.	International Journal Of Disaster Risk Reduction	2020	10.1016/j.ijdrr.2020.101882	4	"This study aimed at identifying the at risk population and at analysing the perceptions of people who experience and those who manage coastal erosion risk, as well as the responses adopted."
1	Comparative analysis of Multi-Criteria Decision-Making methods for flood disaster risk in the Yangtze River Delta	Sun, R.L.; Gong, Z.W.; Gao, G.; Shah, A.A.	International Journal Of Disaster Risk Reduction	2020	10.1016/j.ijdrr.2020.101768	4	"This study used the Yangtze River Delta as the research object, established the flood disaster risk analysis model, calculated the indicator weights using the entropy weight method, and used three Multi-Criteria Decision-Making (MCDM) methods to compare and analyze the flood disaster risk in four administrative units of Yangtze River Delta (Shanghai City, Jiangsu Province, Zhejiang Province, and Anhui Province)."
1	The Scops owl (Otus scops) under human-induced environmental change pressure	Ivajnsic, D.; Denac, D.; Denac, K.; Pipenbaher, N.; Kaligaric, M.	Land Use Policy	2020	10.1016/j.landusepol.2020.104853	4	"Mobile organisms such as raptors, positioned high in the food chain, are good indicators of negative or positive landscape dynamics, since their response is fast. This assumption was tested by investigating the Scops Owl (Otus scops) population in a traditional Central European cultural landscape (Goriko Nature Park [GNP]) in Slovenia."
1	Integrating farmland in urban green infrastructure planning. An evidence synthesis for informed policymaking	Rolf, W.; Diehl, K.; Zasada, I.; Wiggering, H.	Land Use Policy	2020	10.1016/j.landusepol.2020.104823	4	"our paper developed a first evidence synthesis, to evaluate potential of UPUF contributing to policy objectives, thereby tackling major urban challenges."

1	Alternative inclusive approaches for improving climate information services and decision-making in Harare, Zimbabwe	Mubaya, C.P.; Ndebele-Murisa, M.R.; Mamombe, R.	Urban Climate	2020	10.1016/j.uclim.2020.100691	6	Location: city of Harare, Zimbabwe
1	Role of Arabidopsis Splicing factor SF1 in Temperature-Responsive Alternative Splicing of FLM pre-mRNA	Lee, K.C.; Chung, K.S.; Lee, H.T.; Park, J.H.; Lee, J.H.; Kim, J.K.	Frontiers In Plant Science	2020	10.3389/fpls.2020.596354	4	This article aims to understand how temperature affects flowering and its impacts on agricultural production.
1	The importance of climate to emigration intentions from a tropical city in Australia	Zander, K.K.; Garnett, S.T.	Sustainable Cities And Society	2020	10.1016/j.scs.2020.102465	4	"This study aims to assess 1) the extent to which heat influences migration intentions of people living in the tropical city of Darwin, Australia, relative to other drivers, and 2) the type of people most likely to leave because of heat."
1	Role of organizations in preparedness and emergency response to flood disaster in Bangladesh	Hossain, B.	Geoenvironmental Disasters	2020	10.1186/s40677-020-00167-7	4	"The present study is to know the role of organizations and make an assessment on their assistance regarding preparedness and emergency response of flood disaster affected people."
1	The association of the non-indigenous spider crab Pyromaia tuberculata with the jellyfish Catostylus tagi as a potential spread mechanism in European waters	Martins, P.; Bartilotti, C.; Calado, R.	Marine Biodiversity	2020	10.1007/s12526-020-01142-z	4	"The present work reports the association between the non-indigenous spider crab Pyromaia tuberculata, morphologically and molecularly identified, with the autochthonous scyphomedusa Catostylus tagi in European waters."
1	The impact of climate change coping and adaptation strategies on livestock farmers' technical efficiency: the case of rural Ghana	Twumasi, M.A.; Jiang, Y.S.	Environmental Science And Pollution Research	2020	10.1007/s11356-020-11525-1	4	"In this study, a coping and adaptation strategies (CCCAs) index, data envelopment analysis (DEA), and fractional regression model (FRM) are used to explore the impact of farmers' CCCAs on technical efficiency (TE) among goat farmers in Ghana."
1	Techniques and skills of indigenous weather and seasonal climate forecast in Northern Ghana	Nyadzi, E.; Werners, S.E.; Biesbroek, R.; Ludwig, F.	Climate And Development	2020	10.1080/17565529.2020.1831429	4	"In this study, we demonstrate how to quantitatively collect indigenous forecast and connect this to scientific forecasts."
1	Impact of drought associated with high temperatures on Coffea canephora plantations: a case study in Espirito Santo State, Brazil	Venancio, L.P.; Filgueiras, R.; Mantovani, E.C.; do Amaral, C.H.; da Cunha, F.F.; Silva, F.C.D.; Althoff, D.; dos Santos, R.A.; Cavatte, P.C.	Scientific Reports	2020	10.1038/s41598-020-76713-y	4	"Therefore, the objective of this study was to conduct an analysis with technical-scientific basis of the real impact of drought associated with high temperatures and irradiances on the conilon coffee (Coffea canephora Pierre ex Froehner) plantations located in the north, northwest, and northeast regions of the state of Espirito Santo, Brazil."
1	Field-Level Land-Use Adaptation to Local Weather TrendsJEL codes	Ramsey, S.M.; Bergtold, J.S.; Stamm, J.L.H.	American Journal Of Agricultural Economics	2020	10.1111/ajae.12157	4	"This article aims to provide insights into what and how farmers' cropping decisions respond to weather patterns."
1	Does the use of climate information contribute to climate change adaptation? Evidence from Ghana	Owusu, V.; Ma, W.L.; Renwick, A.; Emuah, D.	Climate And Development	2020	10.1080/17565529.2020.1844612	4	"This study examines how the use of climate information affects climate change adaptation measure adopted by household heads, using data collected from the Upper West region of Ghana."
1	Small irrigation users' perceptions of environmental change, impacts, and response in Nepal	Parajuli, J.; Eakin, H.; Chhetri, N.	Climate And Development	2020	10.1080/17565529.2020.1836468	4	This paper focuses on smallholders' perceptions of environmental variability and its impacts, their responses, and the role of Water Users' Associations (WUA) in governing the irrigation system in response to observed environmental changes.
1	Knowledge and perception on ticks and tick-borne diseases among veterinary medicine students from the North African countries of Algeria, Egypt, and Tunisia	Khbou, M.K.; Ayadi, O.; Al-Hosary, A.A.; Darghouth, M.A.; Gharbi, M.	Parasite Epidemiology And Control	2020	10.1016/j.parepi.2020.e00169	4	"This study aimed to assess, in three North African veterinary education establishments, the basic parasitology knowledge of veterinary medicine students."
1	Improving Drought Preparedness Among Utah Cattle Ranchers	Coppock, D.L.	Rangeland Ecology & Management	2020	10.1016/j.rama.2020.08.003	4	"The main research objective was to determine why ranchers often don't adopt recommended drought-mitigation tactics."
1	Towards indigenous community-led monitoring of fish in the oil sands region of Canada: Lessons at the intersection of cultural consensus and fish science	Brunet, N.D.; Jardine, T.D.; Jones, P.D.; Macdermid, F.; Reed, G.; Bogdan, A.M.; Tchir, D.R.; Natcher, D.C.	Extractive Industries And Society-An International Journal	2020	10.1016/j.exis.2020.06.014	4	"This study, conducted with Cold Lake First Nations, Alberta (CLFN), sought to explore local concerns regarding fish consumption safety and population health in response to multiple anthropogenic stressors focusing upon oil extraction."
1	Weather-related influences on rural-to-urban migration: A spectrum of attribution in Beira, Mozambique	Anderson, K.J.; Silva, J.A.	Global Environmental Change-Human And Policy Dimensions	2020	10.1016/j./gloenvcha.2020.102193	4	"This article investigates the pathways linking environmental and economic drivers of rural-to-urban migration in Mozambique."
1	Socio-economic analysis of farmers facing asymmetric information in inputs markets: evidence from the rainfed zone of Pakistan	Ullah, A.; Arshad, M.; Kachele, H.; Zeb, A.; Mahmood, N.; Muller, K.	Technology In Society	2020	10.1016/j.techsoc.2020.101405	4	"this study investigated the role of farmers' socio-economic attributes and farm level characteristics in avoiding asymmetry of information in agricultural input markets (i.e. exaggerated prices and low quality)."
1	The impact of the 2014-2016 drought in Greater Letaba Local Municipality: How the farmers coped and factors that were significantly associated with loss of animals	Rakgwale, T.J.; Oguttu, J.W.	International Journal Of Disaster Risk Reduction	2020	10.1016/j.ijdrr.2020.101869	4	"This study investigated factors that were associated with loss of livestock and the coping strategies farmers adopted."
1	The Impact of Efficacy, Values, and Knowledge on Public Preferences Concerning Food-Water-Energy Policy Tradeoffs	Gardezi, N.U.Z.; Steel, B.S.; Lavado, A.	International Journal Of Environmental Research And Public Health	2020	10.3390/ijerph17228345	4	"Using survey data from random household surveys conducted in western U.S. states during 2018, this study examined how environmental efficacy, values, and knowledge affected FWE public tradeoff preferences."
1	Knowledge and Perceptions of Environmental Issues by African Americans/Blacks in Washington, DC, USA: Giving Voice to the Voiceless	Harrison, E.; Milton, A.D.; Richardson, M.L.	Sustainability	2020	10.3390/su12229495	3	"Our study elucidated knowledge and perceptions of natural resources and climate change by African Americans/Blacks in Washington, DC since they are a traditionally marginalized population and to see if we could dispel the perception that they have low knowledge and interest in environmental issues."

1	Impact of Relative Sea-Level Rise on Low-Lying Coastal Areas of Catalonia, NW Mediterranean, Spain	Lopez-Doriga, U.; Jimenez, J.A.	Water	2020	10.3390/w12113252	4	"This study presents a methodology for improved SLR-induced flood-damage assessments in natural areas which is composed of (i) a pseudo-dynamic method coupling equilibrium-based coastal response and classical bathtub modeling approaches and (ii) a simple method to account for habitat conversion following inundation." SLR= Sea-level rise
1	Climate change adaptation in aquaculture	Galappaththi, E.K.; Ichien, S.T.; Hyman, A.A.; Aubrac, C.J.; Ford, J.D.	Reviews In Aquaculture	2020	10.1111/raq.12427	4	"This study conducts the first systematic literature review of climate change adaptation in aquaculture."
1	Consumers' Attitude towards the Sustainability of Different Food Categories	Sanchez-Bravo, P.; Chambers, E.; Noguera-Artiaga, L.; Lopez-Lluch, D.; Chambers, E.; Carbonell-Barrachina, A.A.; Sendra, E.	Foods	2020	10.3390/foods9111608	4	"The aim of this study was to understand consumers' perceptions and attitudes towards food sustainability based on country, age, gender, income and education level."
1	Stable Allometric Trajectories in Picea abies (L.) Karst. Trees along an Elevational Gradient	Mura, C.; Stromme, C.B.; Anfodillo, T.	Forests	2020	10.3390/f11111231	4	"Addressing the question of whether trees grown at different elevations invest similarly in various organs, we established four sites along an elevational gradient (320 to 595 m a.s.l.) in managed Norway spruce (Picea abies (L.) Karts) stands regenerating after clearcuts in central Norway."
1	Employing Ecotourism Opportunities for Sustainability in the Aral Sea Region: Prospects and Challenges	Saidmamatov, O.; Matyakubov, U.; Rudenko, I.; Filimonau, V.; Day, J.; Luthe, T.	Sustainability	2020	10.3390/su12219249	4	"The paper examines ecotourism in the Aral Sea region of Uzbekistan, an area with a fragile environment that has faced ecological crises and requires careful sustainable development."
1	The Nutrient App: Developing a smartphone application for on-site instantaneous community-based NO3 and PO4 monitoring	Costa, D.; Aziz, U.; Elliott, J.; Baulch, H.; Roy, B.; Schneider, K.; Pomeroy, J.	Environmental Modelling & Software	2020	10.1016/j.envsoft.2020.104829	4	"In this study, an easy-to-use smartphone-based application (The Nutrient App) was developed to estimate NO3 and PO4 concentrations through the image-processing of on-site qualitative colorimetric-based results obtained via cheap commercially-available instantaneous test kits."
1	Toward a nuanced and targeted forest and peat fires prevention policy: Insight from psychology	Trihadmojo, B.; Jones, C.R.; Prasastyoga, B.; Walton, C.; Sulaiman, A.	Forest Policy And Economics	2020	10.1016/j.forpol.2020.102293	4	"Thus, this study examines individual's intention to clear land using fire. We surveyed 151 Indonesian traditional farmers based on the Theory of Planned Behavior (TPB), the Norm Activation Model (NAM) and past behavior."
1	The effect of spatial proximity to cities on rural vulnerability against flooding: An indicator based approach	Jamshed, A.; Birkmann, J.; Rana, I.A.; Feldmeyer, D.	Ecological Indicators	2020	10.1016/j.ecolind.2020.106704	4	"This paper assesses how distance to cities affects the vulnerability of rural farming communities against flood hazard."
1	Micro-level adaptation strategies by smallholders to adapt climate change in the least developed countries (LDCs): Insights from Afghanistan	Omerkhil, N.; Kumar, P.; Mallick, M.; Meru, L.B.; Chand, T.; Rawat, P.S.; Pandey, R.	Ecological Indicators	2020	10.1016/j.ecolind.2020.106781	4	"Therefore, the present study intends to evaluate the adaptation strategies of smallholder farmers based on primary data collected through pre-tested questionnaire from 260 households distributed in 26 villages across both plain and mountain regions of Yangi Qala district, Afghanistan."
1	Climate change and angling behavior on the North shore of Lake Superior (USA)	Hestetune, A.; Jakus, P.M.; Monz, C.; Smith, J.W.	Fisheries Research	2020	10.1016/j.fishres.2020.105717	4	"Using a travel cost model, we measure the demand for angling under current conditions and potential future climate and environmental conditions. Our research also explores the adaptive and coping behaviors of anglers."
1	A hard-to-keep promise: Vegetation use and aboveground carbon storage in silvopastures of the Dry Chaco	Fernandez, P.D.; de Waroux, Y.L.; Jobbagy, E.G.; Loto, D.E.; Gasparri, N.I.	Agriculture Ecosystems & Environment	2020	10.1016/j.agee.2020.107117	4	"Here, we investigate the extent of that tradeoff by analyzing the impact of woody encroachment control practices on carbon storage in silvopastures of the Argentine Dry Chaco."
1	Detecting the drivers of functional diversity in a local lichen flora: a case study on the extinct volcano of Roccamonfina (southern Italy)	Migliozzi, A.; Catalano, I.; Mingo, A.; Aprile, G.G.	Oecologia	2020	10.1007/s00442-020-04790-x	4	"This study is an attempt to detect the drivers affecting functional diversity in the lichen flora of a volcanic Mediterranean area."
1	Synergisms in Science: Climate Change and Integrated Pest Management Through the Lens of Communication-2019 Student Debates	Holt, J.R.; Bernaola, L.; Britt, K.E.; McCullough, C.; Roth, M.; Wagner, J.; Ragozzino, M.; Aviles, L.; Li, Z.L.; Huval, F.; Pandey, M.; Lee, B.W.; Asche, M.; Hayes, A.; Cohen, A.; Marshall, A.; Quellhorst, H.E.; Wilkins, R.V.; Nguyen, V.; Maille, J.; Skinner, R.K.; Ternest, J.J.; Anderson, S.; Gula, S.W.; Hauri, K.; Eason, J.; Mulcahy, M.; Lee, S.; Villegas, J.M.; Shorter, P.	Journal Of Insect Science	2020	10.1093/jisesa/ieaa077	4	"For the 2019 Student Debates, the SAC SDS identified these topic areas for teams to debate and unbiased introduction speakers to address: 1) how to better communicate science to engage the public, particularly in the area of integrated pest management (IPM), 2) the influential impacts of climate change on agriculturally and medically relevant insect pests, and 3) sustainable agriculture techniques that promote the use of IPM to promote food security."
1	Climate-smart livelihood strategies in rural and urban communities in eastern Zimbabwe: an in-depth literature study	Muzorewa, W.; Chitakira, M.	South African Geographical Journal	2020	10.1080/03736245.2020.1835701	8	"This paper applied a realist synthesis method to evaluate peer-reviewed literature on climate-smart livelihood strategies pursued in southern Africa in general and eastern Zimbabwe in particular."
1	Beliefs and Actions Towards an Environmental Ethical Life: The Christianity-Environment Nexus Reflected in a Cross-National Analysis	Petrescu-Mag, R.M.; Ana, A.; Vermeir, I.; Petrescu, D.C.	Journal Of Agricultural & Environmental Ethics	2020	10.1007/s10806-020-09832-1	4	"The present study seeks to introduce the European Christian community to the debate on environmental degradation while displaying its important role and theological perspectives in the resolution of the environmental crisis."
1	Understanding the key characteristics and challenges of pine barrens restoration: insights from a Delphi survey of forest land managers and researchers	Gobster, P.H.; Schneider, I.E.; Floress, K.M.; Haines, A.L.; Arnberger, A.; Dockry, M.J.; Benton, C.	Restoration Ecology	2020	10.1111/rec.13273	4	"As a precursor to designing a public preference survey for pine barrens restoration, we sought input from those with expert knowledge about pine barrens."
1	Farmers' adaptation decisions to landslides and flash floods in the mountainous region of Khyber Pakhtunkhwa of Pakistan	Ahmad, D.; Afzal, M.; Rauf, A.	Environment Development And Sustainability	2020	10.1007/s10668-020-00983-9	4	"This study focused this research gap in scenario of Pakistan and investigated rural households' decision-making adaptation strategies process regarding landslides and flash floods hazards."
1	Do scientists have a responsibility to provide climate change expertise to mitigation and adaptation strategies? Perspectives from climate professionals	Getson, J.M.; Sjostrand, A.E.; Church, S.P.; Weiner, R.; Hatfield, J.L.; Prokopy, L.S.	Public Understanding Of Science	2020	10.1177/0963662520966690	3	"Through a survey (N = 273), we explored climate professionals' perspectives on their role and responsibility to promote climate change adaptation/mitigation strategies related to agroecosystems."

1	Understanding the relevance of indigenous knowledge on climate change adaptation among mixed farmers in the Ngono River Basin, Tanzania	Theodory, T.F.	African Journal Of Science Technology Innovation & Development	2020	10.1080/20421338.2020.1816615	4	"This article assesses the IK used by the mixed farmers in Tanzania to adapt to the impacts of climate change."
1	Teaching and learning in ecology: a horizon scan of emerging challenges and solutions	Cooke, J.; Araya, Y.; Bacon, K.L.; Bagniewska, J.M.; Batty, L.C.; Bishop, T.R.; Burns, M.; Charalambous, M.; Daversa, D.R.; Dougherty, L.R.; Dyson, M.; Fisher, A.M.; Forman, D.; Garcia, C.; Harney, E.; Hesselberg, T.; John, E.A.; Knell, R.J.; Maseyk, K.; Mauchline, A.L;. Peacock, J.; Pernetta, A.P.; Pritchard, J.; Sutherland, W.J.; Thomas, R.L.; Tigar, B.; Wheeler, P.; White, R.L.; Worsfold, N.T.; Lewis, Z.	Oikos	2020	10.1111/oik.07847	4	"Here we present the results of a horizon scanning exercise that identified current and future challenges facing the teaching of ecology, through surveys of teachers, students and employers of ecologists."
1	Dynamics of forage and land cover changes in Teltele district of Borana rangelands, southern Ethiopia: using geospatial and field survey data	Fenetahun, Y.; Wang, Y.D.; Yuan, Y.; Xu, X.W.	Bmc Ecology	2020	10.1186/s12898-020-00320-8	4	"This study aimed to examine the changes, drivers, trends in land use and land cover (LULC), to determine the link between the Normalized Difference Vegetation Index (NDVI) and forage biomass and the associated impacts of forage biomass production dynamics on the Teltele rangelands in Southern Ethiopia."
1	An analysis of economic benefits from adoption of drought tolerant soybean (Glycine max) in Madhya Pradesh	Raghavendra, K.J.; Suresh, A.	Indian Journal Of Agricultural Sciences	2020		4	"In this study, the potential economic benefit in terms of economic surplus and risk reduction was estimated for NRC-7 and alternative varieties."
1	Developing small-scale bamboo enterprises for livelihoods and environmental restoration in Benishangul-Gumuz Regional State, Ethiopia	Boissiere, M.; Atmadja, S.; Benmakhlouf, S.; Beyessa, M.; Kassa, H.; Hunde, T.; Assefa, F.	International Forestry Review	2020	10.1505/146554820830405618	4	"We document the perceptions, practices and policy options in managing lowland bamboo [Oxytenanthera abyssinica] in Benishangul Gumuz Regional State (BGRS) in Ethiopia. particularly to enable small-scale enterprises (SSE) to become more active in this field."
1	Understanding the Coula edulis, Dacryodes buettneri and Irvingia gabonensis non-timber forest product value chains from Makokou, North-East Gabon from a gender perspective	Yobo, C.M.; Awono, A.; Ingram, V.	International Forestry Review	2020	10.1505/146554820830405672	4	"This study assesses gender dynamics, reasons for entering the trade, economics, and perceived threats to Coula edulis, Dacryodes buettneri, and Irvingia gabonensis value chains originating in Makokou, Gabon."
1	Climate Change, Agency Decision-Making, and the Resilience of Land-Based Livelihoods	Knapp, C.N.; McNeeley, S.M.; Gioia, J.; Even, T.; Beeton, T.	Weather Climate And Society	2020	10.1175/WCAS-D-19-0097.1	3	"This project was designed to understand how Bureau of Land Management (BLM) permittees, including ranching and recreation-based businesses in Colorado, are vulnerable to both climate change and management responses and how permittees and the BLM are adapting and could adapt to these changes."
1	Evaluation of the Objectives and Concerns of Farmers to Apply Different Agricultural Managements in Olive Groves: The Case of Estepa Region (Southern, Spain)	Sousa, A.A.R.; Parra-Lopez, C.; Sayadi-Gmada, S.; Barandica, J.M.; Rescia, A.J.	Land	2020	10.3390/land9100366	4	"The main objective/purpose of this research was to study the drivers and concerns that condition farmers' choice of a given olive grove management model."
1	Consumers' Purchasing Intentions on the Legume Market as Evidence of Sustainable Behaviour	Smiglak-Krajewska, M.; Wojciechowska-Solis, J.; Viti, D.	Agriculture-Basel	2020	10.3390/agriculture10100424	4	"The purpose of this paper is to verify the knowledge that is useful for legume producers in relation to consumers' eating habits in the field of legume products."
1	The effects of farmers' adoption behavior of soil and water conservation measures on agricultural output	Huang, X.H.; Lu, Q.; Yang, F.	International Journal Of Climate Change Strategies And Management	2020	10.1108/IJCCSM-02-2020-0014	4	"This paper aims to build a theoretical model of the impact of farmers' adoption behavior of soil and water conservation measures on the agricultural output to analyze the impact of farmers' adoption behavior of soil and water conservation measures on agricultural output."
1	Assessing ecosystem resilience to a tropical cyclone based on ecosystem service supply proficiency using geospatial techniques and social responses in coastal Bangladesh	Islam, M.A.; Paull, D.J.; Griffin, A.L.; Murshed, S.	International Journal Of Disaster Risk Reduction	2020	10.1016/j.ijdrr.2020.101667	4	"We examined ecosystem resilience to a tropical cyclone in a southwestern coastal region of Bangladesh in terms of its impacts on the ecosystem's service supply proficiency (ESSP)."
1	Wireless sensor network for small-scale farming systems in southwest Iran: Application of Q-methodology to investigate farmers' perceptions	Taheri, F.; D'Haese, M.; Fiems, D.; Hosseininia, G.H.; Azadi, H.	Computers And Electronics In Agriculture	2020	10.1016/j.compag.2020.105682	4	"This study aims at closing this gap by investigating the small-scale farmers' perception regarding the application of WSNs for farming systems in Khuzestan Province, Iran. " WSNs= Wireless sensor network
1	What does organic mean for farmers? A qualitative study on their perceptions and motivations about organic farming	Capdevila, C.	Ager-Revista De Estudios Sobre Despoblacion Y Desarrollo Rural	2020	10.4422/ager.2020.08	4	"The overall objective of this research is to find out producers' views about organic agriculture and farm labour."
1	Policy forum: Proposal of a Mexican precision agroforestry policy	Montes, O.; Uribe, M.; Castro, R.; Villanueva, C.; Perez, M.; Lara, A.	Forest Policy And Economics	2020	10.1016/j.forpol.2020.102292	4	"The main objective of this paper is to propose a Mexican precision agroforestry policy to promote economic growth and a resilient economy to climate change through the implementation of precision agriculture, and agroforestry 4.0 technologies for the diagnosis, monitoring, plots management, and commercialization in the Mexican agroforestry sector."
1	Community Marine Monitoring Toolkit: A tool developed in the Pacific to inform community-based marine resource management	Johnson, J.E.; Hooper, E.; Welch, D.J.	Marine Pollution Bulletin	2020	10.1016/j.marpolbul.2020.111498	4	"A novel marine monitoring toolkit was developed in Vanuatu with the participation of community resource monitors to inform local management actions."

1	Water usage and productivity of Boro rice at the field level and their impacts on the sustainable groundwater irrigation in the North-West Bangladesh	Mainuddin, M.; Maniruzzaman, M.; Alam, M.M.; Mojid, M.A.; Schmidt, E.J.; Islam, M.T.; Scobie, M.	Agricultural Water Management	2020	10.1016/j.agwat.2020.106294	4	"it is crucial to know the actual field-level water usage and, irrigation water productivity, which will help identifying options to sustain groundwater irrigation. This study provides a comprehensive account of these aspects of Boro rice cultivation based on field observations at 420 farmers' plots in 2015-16 and 2016-17 seasons across seven sites in the NW region."
1	Watershed degradation and management practices in north-western highland Ethiopia	Moges, D.M.; Bhat, H.G.	Environmental Monitoring And Assessment	2020	10.1007/s10661-020-08628-0	4	"This paper assesses an overview of the extent, causes, and effects of watershed degradation and the management actions in north-western highland Ethiopia, taking the Rib watershed as a case study site."
1	Evaluating the relationship between climate variability and agricultural crops under indeterminacy	Janjua, A.A.; Aslam, M.; Sultana, N.	Theoretical And Applied Climatology	2020	10.1007/s00704-020-03398-8	4	"This study investigates the climate impact on rice yield."
1	The role of artificial ditches and their buffer zones in intensively utilized agricultural landscape	Kozelova, I.; Spulerova, J.; Miklosova, V.; Gerhatova, K.; Izakovicova, Z.; Kalivoda, H.; Kalivodova, M.; Kanka, R.	Environmental Monitoring And Assessment	2020	10.1007/s10661-020-08610-w	4	"Our study focuses on the assessment of the benefits provided by the ecosystems of water ditches and their catchment areas."
1	Adoption potentials and barriers of silvopastoral system in Colombia: Case of Cundinamarca region	Lee, S.; Bonatti, M.; Lohr, K.; Palacios, V.; Lana, M.A.; Sieber, S.	Cogent Environmental Science	2020	10.1080/23311843.2020.1823632	4	"Thus, the objective of this work is to investigate the potential for scaling up the adoption of SPS by identifying the barriers perceived by farmers, using a case study of tropical land at a high altitude over 2400 m in Cundinamarca department, Colombia." SPS= Silvopastoral system
1	Contrasting Impacts of Cultivated Exotics on the Functional Diversity of Domestic Gardens in Three Regions with Different Aridity	Cubino, J.P.; Borowy, D.; Knapp, S.; Lososova, Z.; Ricotta, C.; Siebert, S.; Cavender-Bares, J.; Sol, D.; Jeliazkov, A.; Swan, C.	Ecosystems	2020	10.1007/s10021-020-00556-x	4	"Here, we investigated whether the effects of cultivated exotics on functional diversity of three plant traits related to plant aesthetics (that is, plant showiness, plant height, and leaf area) varied in suburban domestic gardens in three regions (Minnesota, USA; Alt Emporda, Spain; and central South Africa) that differ in aridity."
1	Assessing impacts of human-elephant conflict on human wellbeing: An empirical analysis of communities living with elephants around Maasai Mara National Reserve in Kenya	Nyumba, T.O.; Emenye, O.E.; Leader-Williams, N.	Plos One	2020	10.1371/journal.pone.0239545	4	"We evaluated the impacts of conflicts on the wellbeing of local communities around the world-famous Masai Mara National Reserve in Kenya." Focuses on human-elephant conflict.
1	Mapping farmers' vulnerability to climate change and its induced hazards: evidence from the rice-growing zones of Punjab, Pakistan	Khan, N.A.; Gao, Q.J.; Abid, M.; Shah, A.A.	Environmental Science And Pollution Research	2020	10.1007/s11356-020-10758-4	4	"The current study is aimed at mapping the vulnerability of rice-growing communities of Punjab province while considering climatic challenges beyond temperatures and rainfall changes."
1	Indiscriminate, Irrelevant, and Sometimes Wrong: Causal Misconceptions about Climate Change	Fleming, W.; Hayes, A.L.; Crosman, K.M.; Bostrom, A.	Risk Analysis	2020	10.1111/risa.13587	3	Explores the nature and prevalence of misconceptions about climate change causes and risks in the United States.
1	Flood vulnerability and its influencing factors	Pathak, S.; Panta, H.K.; Bhandari, T.; Paudel, K.P.	Natural Hazards	2020	10.1007/s11069-020-04267-3	4	"We use face-to-face interview data collected from 217 households located in the Saptari district of Nepal to understand the household-level vulnerability of farmers impacted by floods."
1	Risk and experience drive the importance of natural hazards for peoples' mobility decisions	Zander, K.K.; Garnett, S.	Climatic Change	2020	10.1007/s10584-020-02846-8	4	"Here, we present results from two online surveys about mobility decisions from one low (Philippines) and one high (Australia) income country within the Asia-Pacific region with similar vulnerabilities to natural hazards."
1	Reassessing the Variables Used to Measure Public Perceptions of Scientists	Besley, J.C.; Lee, N.I.M.; Pressgrove, G.	Science Communication	2020	10.1177/1075547020949547	4	"Through an examination of existing scales and a national survey (N= 605), this study suggests that communication researchers and practitioners should consider focusing on four distinct dimensions of trust."
1	Analysis of perception and adaptation of maize-based farming households to climate change in Nigeria	Coster, A.S.; Adeoti, A.I.	Tropical Agriculture	2020		2	Maize-based farming households
1	Does Chinese FDI, Climate Change, and CO2 Emissions Stimulate Agricultural Productivity? An Empirical Evidence from Pakistan	Ahmad, S.; Tariq, M.; Hussain, T.; Abbas, Q.; Elham, H.; Haider, I.; Li, X.M.	Sustainability	2020	10.3390/su12187485	4	"this paper aims to highlight the present situation of the agriculture sector of Pakistan and empirically analyze the short-run and long-run impact of Chinese foreign direct investment (CFDI), climate change, and CO2 emissions on agricultural productivity and causality among the variables."
1	Willingness to Pay for Livestock Husbandry Insurance: An Empirical Analysis of Grassland Farms in Inner Mongolia, China	Dong, H.B.; Jimoh, S.O.; Hou, Y.L.; Hou, X.Y.	Sustainability	2020	10.3390/su12187331	4	"The current study focused on the status, and determinants of herders' willingness to purchase LHI." LHI= Livestock husbandry insurance
1	Identifying Barriers and Enablers for Climate Change Adaptation of Farmers in Semi-Arid North-Western China	Mu, L.; Fang, L.; Liu, Y.H.; Wang, C.C.	Sustainability	2020	10.3390/su12187494	3	Non smallholders.
7	Woodland Cover Change in the Central Rift Valley of Ethiopia	Mesfin, D.; Simane, B.; Belay, A.; Recha, J.W.; Taddese, H.	Forests	2020	10.3390/f11090916	4	"The study used a combination of both quantitative and qualitative methods to analyze the extent and pattern of woodland cover changes from 1973 to 2013."
1	Accessing Local Tacit Knowledge as a Means of Knowledge Co-Production for Effective Wildlife Corridor Planning in the Chignecto Isthmus, Canada	Needham, J.L.; Beazley, K.F.; Papuga, V.P.	Land	2020	10.3390/land9090332	4	"This paper explores local tacit knowledge application to identify wildlife locations, movement patterns and heightened opportunities and barriers for connectivity conservation planning in a critical linkage area known as the Chignecto Isthmus in the eastern Canadian provinces of Nova Scotia and New Brunswick."
1	Soil organic carbon stocks under recommended management practices in different soils of semiarid vineyards	Gristina, L.; Scalenghe, R.; Garcia-Diaz, A.; Matranga, M.G.; Ferraro, V.; Guaitoli, F.; Novara, A.	Land Degradation & Development	2020	10.1002/ldr.3339	4	"the aim of the work was to define specific IPCC coefficient taking into account differences in pedological characteristics that affect soil C steady state."
1	Using Public Participation Geographic Information Systems (PPGIS) to Identify Valued Landscapes Vulnerable to Sea Level Rise	Morse, W.C.; Cox, C.; Anderson, C.J.	Sustainability	2020	10.3390/su12176711	4	"The objective of this study was to assess the locations of a range of landscape values, ecosystem services, and development preferences held and identified by the general public using PPGIS to determine if those valued locations are vulnerable to sea level rise." PPGIS= Participation Geographic Information Systems
1	Identifying spatial conservation priorities using Traditional and Local Ecological Knowledge of iconic marine species and ecosystem threats	Noble, M.M.; Harasti, D.; Fulton, C.J.; Doran, B.	Biological Conservation	2020	10.1016/j.biocon.2020.108709	4	"Participatory mapping and semi structured interviews were conducted with 52 stakeholders and 22 managers and scientists to identify ecological priorities and concerns across a large temperate MPA in Port Stephens-Great Lakes Marine Park, Australia."

1	Review: Climate Finance readiness of the animal protein sector: overview of experience in linking the sector to Climate Finance, and options to address bottlenecks	Masse, J.; Gerber, P.J.; Halpern, C.; Baedeker, T.	Animal	2020	10.1017/S1751731120001755	4	This article consists of a review on climate finance readiness of the animal protein sector
1	Farming decisions in a complex and uncertain world: Nitrogen management in Midwestern corn agriculture	Reimer, A.P.; Houser, M.K.; Marquart-Pyatt, S.T.	Journal Of Soil And Water Conservation	2020	10.2489/jswc.2020.00070	4	"Through analysis of in-depth interviews with US corn (Zea mays L.) growers, this study reveals how farmers experience and process numerous uncertainties associated with N management, such as weather variability, crop and input price volatility, lack of knowledge about biophysical systems, and the possibility of underapplying or overapplying." N= Nitrogen
1	Enabling coexistence: Navigating predator-induced regime shifts in human-ocean systems	Burt, J.M.; Wilson, K.B.J.; Malchoff, T.; Mack, W.T.K.A.; Davidson, S.H.A.; Gitkinjuaas; Salomon, A.K.	People And Nature	2020	10.1002/pan3.10090	4	This article examines indigenous people perceptions of the social-ecological conditions that affect their ability to adapt to environmental changes triggered by predators, specifically sea otters.
7	Convergence between satellite information and farmers' perception of drought in rangelands of North-West Patagonia, Argentina	Solano-Hernandez, A.; Bruzzone, O.; Groot, J.; Laborda, L.; Martinez, A.; Tittonell, P.; Easdale, M.H.	Land Use Policy	2020	10.1016/j.landusepol.2020.104726	3	The abstract does not mention if the farmers are smallholders.
1	Smallholder oil palm farmers' pro-adaptation behaviour under climate impact scenario: application of protection Motivation Theory	Nabara, I.S.; Man, N.; Kamarulzaman, N.H.; Sulaiman, Z.	Climate And Development	2020	10.1080/17565529.2020.1801374	4	A study of 382 smallholder farmers in the Malaysian peninsula was conducted using a multi-stage stratified random sampling technique, revealing that specific farmers were postponing protection actions in the face of serious continuous impact.
1	Attuning to a changing ocean	Stenseth, N.C.; Payne, M.R.; Bonsdorff, E.; Dankel, D.J.; Durant, J.M.; Anderson, L.G.; Armstrong, C.W.; Blenckner, T.; Brakstad, A.; Dupont, S.; Eikeset, A.M.; Goksoyr, A.; Jonssonn, S.; Kuparinen, A.; Vage, K.; Osterblom, H.; Paasche, O.	Proceedings Of The National Academy Of Sciences Of The United States Of America	2020	10.1073/pnas.1915352117	4	This article explores how collaborations among science, policy and practice have developed in the Nordic countries and adjacent seas, and how knowledge from these regions contributes to an understanding of how to obtain a sustainable ocean.
1	Forestry Professionals' Perceptions of Climate Change Impacts on the Forest Industry in Maine, USA	Soucy, A.; De Urioste-Stone, S.; Rahimzadeh-Bajgiran, P.; Weiskittel, A.; McGreavy, B.	Journal Of Sustainable Forestry	2020	10.1080/10549811.2020.1803919	3	"We describe a multi-method approach using nominal group technique and semi-structured interviews to identify and understand experts' concerns in regards to future climate change impacts on the forest industry in Maine, USA."
1	Rice farmers adapting to drought in the Philippines	Manalo, J.A.; van de Fliert, E.; Fielding, K.	International Journal Of Agricultural Sustainability	2020	10.1080/14735903.2020.1807301	2	Monoculture rice farmers.
1	Synergy between adaptations and resilience of livelihood from climate change vulnerability: A group-wise comparison of adapters and non-adapters	Naqvi, S.A.A.; ul Hassan, R.H.; Wu, W.Y.; Shah, A.A.; Makhdum, M.S.A.; Shah, S.A.R.	Plos One	2020	10.1371/journal.pone.0236794	4	"This study analyzed the influence of climate change adaptations and synergy between resilience from livelihood vulnerability and adaptations."
1	Determinants of small-scale farmers' choice and adaptive strategies in response to climatic shocks in Vhembe District, South Africa	Kom, Z.; Nethengwe, N.S.; Mpandeli, N.S.; Chikoore, H.	Geojournal	2020	10.1007/s10708-020-10272-7	4	"This paper presents the analysis of how small-scale farmers employed adaptation strategies in response to climate change and determinants of small-scale households' choices of coping and adaptation approach to climate variability and change in Vhembe District, South Africa."
1	Personal Stories Can Shift Climate Change Beliefs and Risk Perceptions: The Mediating Role of Emotion	Gustafson, A.; Ballew, M.T.; Goldberg, M.H.; Cutler, M.J.; Rosenthal, S.A.; Leiserowitz, A.	Communication Reports	2020	10.1080/08934215.2020.1799049	3	No mention to small-scale populations.
1	Declining native fish, diminishing livelihood security: the predicament of Indian Himalayan communities	Gupta, N.; Everard, M.; Namchu, C.V.	International Journal Of River Basin Management	2020	10.1080/15715124.2020.1790578	4	From a indigenous perspective, presents factors and anthropogenic stressors compounded by climate change on depletion of native fish populations in Himalayan
1	Vulnerability of Fishery-Based Livelihoods to Extreme Events: Local Perceptions of Damages from Hurricane Irma and Tropical Storm Alberto in Yaguajay, Central Cuba	Ramenzoni, V.C.; Escuela, D.B.; Rivero, A.R.; Gonzalez-Diaz, P.; Sanchez, V.V.; Lopez-Castaneda, L.; Mendez, A.F.; Ramos, I.H.; Lopez, N.V.H.; Besonen, M.R.; Yoskowitz, D.	Coastal Management	2020	10.1080/08920753.2020.1802198	4	Focusing on an artisanal fishery in Yaguajay, Sancti Spiritus, Cuba, this article explores how artisanal fishers have perceived and responded to the different damages brought about by Hurricane Irma in September 2017 and the inundations associated with Storm Alberto in May 2018.
1	Risk Management Strategies to Cope Catastrophic Risks in Agriculture: The Case of Contract Farming, Diversification and Precautionary Savings	Adnan, K.M.M.; Ying, L.; Ayoub, Z.; Sarker, S.A.; Menhas, R.; Chen, F.Y.; Yu, M.	Agriculture-Basel	2020	10.3390/agriculture10080351	2	Monoculture maize farmers

1	Plant science decadal vision 2020-2030: Reimagining the potential of plants for a healthy and sustainable future	Henkhaus, N.; Bartlett, M.; Gang, D.; Grumet, R.; Jordon-Thaden, I.; Lorence, A.; Lyons, E.; Miller, S.; Murray, S.; Nelson, A.; Specht, C.; Tyler, B.; Wentworth, T.; Ackerly, D.; Baltensperger, D.; Benfey, P.; Birchler, J.; Chellamma, S.; Crowder, R.; Donoghue, M.; Dundore-Arias, J.P;. Fletcher, J.; Fraser, V.; Gillespie, K.; Guralnick, L.; Haswell, E.; Hunter, M.; Kaeppler, S.; Kepinski, S.; Li, F.W.; Mackenzie, S.; McDade, L.; Min, Y.; Nemhauser, J.; Pearson, B.; Petracek, P.; Rogers, K.; Sakai, A.; Sickler, D.; Taylor, C.; Wayne, L.; Wendroth, O.; Zapata, F.; Stern, D.	Plant Direct	2020	10.1002/pld3.252	4	"The research encompass experimental and computational approaches to understanding and predicting ecosystem behavior; novel production systems for food, feed, and fiber with greater crop diversity, efficiency, productivity, and resilience that improve ecosystem health; approaches to realize the potential for advances in nutrition, discovery and engineering of plant-based medicines, and green infrastructure."
1	Expert Knowledge and Perceptions about the Ecosystem Services and Natural Values of Hungarian Fishpond Systems	Palasti, P.; Kiss, M.; Gulyas, A.; Kerepeczki, E.	Water	2020	10.3390/w12082144	3	"In this paper, we reveal the ESs of three semi-intensively managed fishpond systems in Hungary and assess the knowledge and perceptions of local experts about them and their main interactions."
1	Is there a demand for collective urban gardens? Needs and motivations of potential gardeners in Belgrade	Cepic, S.; Tomicevic-Dubljevic, J.; Zivojinovic, I.	Urban Forestry & Urban Greening	2020	10.1016/j.ufug.2020.126716	4	"This paper fills the gap to a certain extent by providing first insights into the demand for collective urban gardens in the city of Belgrade."
1	Farmers' landslide risk perceptions and willingness for restoration and conservation of world heritage site of Honghe Hani Rice Terraces, China	Gao, X.; Roder, G.; Jiao, Y.M.; Ding, Y.P.; Liu, Z.L.; Tarolli, P.	Landslides	2020	10.1007/s10346-020-01389-4	4	This article approaches how farmers landslide risk perceptions can influence the desire to increase their knowledge on terraces restoration and conservation practices.
1	Examining forest cover change and deforestation drivers in Taunggyi District, Shan State, Myanmar	Sharma, P.; Thapa, R.B.; Matin, M.A.	Environment Development And Sustainability	2020	10.1007/s10668-019-00436-y	4	"This study examines a methodology to identify potential drivers and their relative significance for deforestation."
1	Flood Risk Perception in the Housing Market and the Impact of a Major Flood Event	Hennighausen, H.; Suter, J.F.	Land Economics	2020	10.3368/le.96.3.366	4	"Using a triple-difference hedonic framework, we show that inundated properties inside the floodplain underwent a decrease in price after the flood, while near misses saw a relative price increase."
1	Aquaculture farmers' perceptions of climate-related risks in the Mekong Region	Lebel, L.; Lebel, P.; Soe, K.M.; Phuong, N.T.; Navy, H.; Phousavanh, P.; Jutagate, T.; Akester, M.; Lebel, B.	Regional Environmental Change	2020	10.1007/s10113-020-01688-5	4	The abstract doesn't mention if the farmers are smallholders. This study documents key findings from a large-scale survey of levels of concern and experience with significant losses of over 3300 aquaculture farmers in Cambodia, Laos, Myanmar, Thailand, and Vietnam.
1	Navigating Climate Adaptation on Public Lands: How Views on Ecosystem Change and Scale Interact with Management Approaches	Clifford, K.R.; Yung, L.; Travis, W.R.; Rondeau, R.; Neely, B.; Rangwala, I.; Burkardt, N.; Wyborn, C.	Environmental Management	2020	10.1007/s00267-020-01336-y	3	"This study employed in-depth interviews and scenario-based focus groups in the Upper Gunnison Basin in Colorado to learn how public land managers envision future ecosystem change, and how they plan to utilize different management approaches in the context of climate adaptation."
1	Impact of climate change on food security in Saudi Arabia: a roadmap to agriculture-water sustainability	Haque, M.I.; Khan, M.R.	Journal Of Agribusiness In Developing And Emerging Economies	2020	10.1108/JADEE-06-2020-0127	4	"The purpose of this paper is to provide a detailed analysis of the trends in temperature and rainfall over the period 1967-2016 (50 years) for the Kingdom of Saudi Arabia and estimate the effect of these climatic changes on major crop production."
1	Caribbean reefs of the Anthropocene: Variance in ecosystem metrics indicates bright spots on coral depauperate reefs	Lester, S.E.; Rassweiler, A.; McCoy, S.J.; Dubel, A.K.; Donovan, M.K.; Miller, M.W.; Miller, S.D.; Ruttenberg, B.I.; Samhouri, J.F.; Hay, M.E.	Global Change Biology	2020	10.1111/gcb.15253	4	"We evaluate 10 key ecosystem metrics, relating to a variety of different reef ecosystem functions and services, on 328 Caribbean reefs varying in coral cover."
1	The impacts of land use and land cover dynamics on natural resources and rural livelihoods in Dedza District, Malawi	Munthali, M.G.; Davis, N.; Adeola, A.M.; Botai, J.O.	Geocarto International	2020	10.1080/10106049.2020.1791978	4	"This study examined the impacts of LULC changes on natural resources and rural livelihoods of Central Malawi." LULC= Land use and land cover
1	Embedding farmers' groundwater use in the context of their livelihoods: farmers' perspectives on social-ecological stressors, causes, and solutions	Hashemi, S.M.; Kinzig, A.; Eakin, H.; Sedaghat, R.; Abbott, J.K.	International Journal Of Sustainable Development And World Ecology	2020	10.1080/13504509.2020.1787277	4	"With a focus on farmers, using a behavioral approach, we explore how the groundwater system, which consists of human and water elements, is seen by pistachio growers in Rafsanjan, Iran (a major pistachio-production region in the world)."
1	The importance of farmers' perceptions of salinity and adaptation strategies for ensuring food security: Evidence from the coastal rice growing areas of Bangladesh	Islam, M.A;. Warwick, N.; Koech, R.; Amin, M.N.; de Bruyn, L.L.	Science Of The Total Environment	2020	10.1016/j.scitotenv.2020.138674	4	"This research examined rice farmers' perceptions of salinity, adaptation strategies, and its implications for policy initiatives to sustain rice production in the affected coastal areas of Bangladesh."
1	Strategic assessment of COVID-19 pandemic in Bangladesh: comparative lockdown scenario analysis, public perception, and management for sustainability	Shammi, M.; Bodrud-Doza, M.; Islam, A.M.T.; Rahman, M.M.	Environment Development And Sustainability	2020	10.1007/s10668-020-00867-y	4	"This article, therefore, focuses on the public perception of comparative lockdown scenario analysis and how they may affect the sustainable development goals (SDGs) and the strategic management regime of COVID-19 pandemic in Bangladesh socio-economically as well as the implications of the withdrawal of partial lockdown plan."

1	Opportunities and constraints for adoption of maize-legume mixed cropping systems in Laos	Lienhard, P.; Lestrelin, G.; Phanthanivong, I.; Kiewvongphachan, X.; Leudphanane, B.; Lairez, J.; Quoc, H.T.; Castella, J.C.	International Journal Of Agricultural Sustainability	2020	10.1080/14735903.2020.1792680	4	This article aims to evaluate the opportunities and constraints for farmers to adopt maize-legume mixed cropping systems.
1	Factors Influencing Measure-based Adaptation of Rice Farmers for Slow-Onset Hazard: the Case of Saltwater Inundation in the Philippines and Vietnam	Almaden, C.R.C.; Diep, T.T.; Rola, A.C.; Baconguis, R.D.T.; Pulhin, J.M.; Camacho, J.V.; Ancog, R.C.	Environmental Management	2020	10.1007/s00267-020-01332-2	4	"This study sought to determine the factors influencing rice farmers' adaptation to a slow-onset hazard such as saltwater inundation."
1	Why apple orchards are shifting to the higher altitudes of the Himalayas?	Sahu, N.; Saini, A.; Behera, S.K.; Sayama, T.; Sahu, L.; Nguyen, V.T.V.; Takara, K.	Plos One	2020	10.1371/journal.pone.0235041	4	"The present study focuses on the apple orchards of Himachal Pradesh, a state within the Himalayan Mountains, a major apple producers of India. In the study, it is found that the optimum apple growing conditions in the region have been consistently shifting and farmers are shifting their orchards to the higher altitudes."
1	Farmers' willingness-to-pay for eco-friendly agricultural waste management in Ethiopia: A contingent valuation	Atinkut, H.B.; Yan, T.W.; Arega, Y.; Raza, M.H.	Journal Of Cleaner Production	2020	10.1016/j.jclepro.2020.121211	4	"In this study, we seek to assess the current AWM status, farmers' willingness to pay (WTP), and the factors affecting WTP for eco-friendly AWM in the Mirab Gojjam, Amhara region of Ethiopia, which has not been studied previously.
1	Landscape predictors of human-leopard conflicts within multi-use areas of the Himalayan region	Naha, D.; Dash, S.K.; Chettri, A.; Chaudhary, P.; Sonker, G.; Heurich, M.; Rawat, G.S.; Sathyakumar, S.	Scientific Reports	2020	10.1038/s41598-020-67980-w	4	"We investigated 857 attacks on livestock in eastern Himalaya and 375 attacks in western Himalaya by leopards between 2015 and 2018."
1	Modeling multivariate landscape affordances and functional ecosystem connectivity in landscape archeology	Kempf, M.	Archaeological And Anthropological Sciences	2020	10.1007/s12520-020-01127-w	4	"This article presents a comprehensive multivariate environmental analysis from a regional case study in the Upper Rhine Valley and exemplifies the bias of the archeological record based on modern land use, built-up, and surface change."
1	Losses and damages connected to glacier retreat in the Cordillera Blanca, Peru	Motschmann, A.; Huggel, C.; Carey, M.; Moulton, H.; Walker-Crawford, N.; Munoz, R.	Climatic Change	2020	10.1007/s10584-020-02770-x	4	"In this study, we analyze impacts of mountain cryosphere change through a lens of Loss and Damage (L&D), a mechanism of international climate policy that tries to evaluate and reduce negative consequences of climate change for societies."
1	Societal attention toward extinction threats: a comparison between climate change and biological invasions	Jaric, I.; Bellard, C.; Courchamp, F.; Kalinkat, G.; Meinard, Y.; Roberts, D.L.; Correia, R.A.	Scientific Reports	2020	10.1038/s41598-020-67931-5	4	"we assessed general public attention in France, Germany and the United Kingdom toward climate change and biological invasions in relation to endangered amphibian, reptile, bird and mammal species."
1	Hybrid-maize seed certification and smallholder adoption in Zambia	Blekking, J.; Waldman, K.B.; Evans, T.	Journal Of Environmental Planning And Management	2020	10.1080/09640568.2020.1764342	4	"Using an institutional analysis framework, we illustrate the complex system of actors and feedback that governs the seed certification process in Zambia."
1	Exploring smallholders' cultural beliefs and their implication for adaptation to climate change in North-Western Nigeria	Jellason, N.P.; Conway, J.S.; Baines, R.N.	Social Science Journal	2020	10.1080/03623319.2020.1774720	4	This paper examined coping and adaptation strategies employed by smallholder farmers and their efficacy in response to climate change in Zango and Kofa communities in North-Western Nigeria.
1	Factors affecting farmers' acceptance and perception of a potential incentive scheme in grassland areas	Chen, Y.; Zhou, L.H.; Hou, C.X.	Social Science Journal	2020	10.1016/j.soscij.2018.11.006	4	"The aims of this case study were to assess farmers' acceptance and perception of a potential GFPBR scheme, using Yanchi County as an example, and to evaluate the driving factors." GFPBR= Grazing fees and payment by results
1	Temporal variation of the fishers' perception about the stalked barnacle (Pollicipes pollicipes) fishery at the Berlengas Nature Reserve (Portugal)	Sousa, A.; Jacinto, D.; Penteado, N.; Pereira, D.; Silva, T.; Castro, J.J.; Leandro, S.M.; Cruz, T.	Regional Studies In Marine Science	2020	10.1016/j.rsma.2020.101378	4	"The main objective of the present study was to evaluate the temporal variation in the perception of P. pollicipes fishers at Berlengas Nature Reserve (RNB, the first area in Portugal to be managed for this fishery, since 2000) regarding the state of the fishery and the state of the management, and the implementation of a co-management system applied to the harvesting of this resource at RNB."
1	Seroprevalence and Molecular Identification ofBrucellaspp. in Camels in Egypt	Khan, A.U.; Sayour, A.E.; Melzer, F.; El-Soally, S.A.G.E.; Elschner, M.C.; Shell, W.S.; Moawad, A.A.; Mohamed, S.A;. Hendam, A.; Roesler, U.; Neubauer, H.; El-Adawy, H.	Microorganisms	2020	10.3390/microorganisms8071035	4	"This study is focused on the three governorates with the highest camel populations and the largest camel markets in the country to determine the disease seroprevalence and identify theBrucellaspecies in local camel holdings."
1	Ecological and Economic Indicators for the Evaluation of Almond (Prunus dulcis L.) Orchard Renewal in Sicily	Sottile, F.; Massaglia, S.; Peano, C.	Agriculture-Basel	2020	10.3390/agriculture10070301	4	"In this work, through the application of the Life Cycle Assessment (LCA) and an economic assessment approach with an in-depth analysis related to the cultivation cycle and the use of resources, the role played by each factor involved in production was determined."
1	Farmers' Beliefs and Concerns about Climate Change: An Assessment from Southern Saudi Arabia	Alotaibi, B.A.; Kassem, H.S.; Nayak, R.K.; Muddassir, M.	Agriculture-Basel	2020	10.3390/agriculture10070253	3	The abstract does not mention if the farmers are smallholders.
1	Farmers' Perception and Evaluation of Brachiaria Grass (Brachiaria spp.) Genotypes for Smallholder Cereal-Livestock Production in East Africa	Cheruiyot, D.; Midega, C.A.O.; Pittchar, J.O.; Pickett, J.A.; Khan, Z.R.	Agriculture-Basel	2020	10.3390/agriculture10070268	4	"A study was undertaken to (i) assess smallholder farmers' perception on benefits of brachiaria in cereal-livestock production, (ii) identify brachiaria production constraints, and (iii) identify farmer preferred brachiaria genotypes."
1	Wading through the swamp: what does tropical peatland restoration mean to national-level stakeholders in Indonesia?	Ward, C.; Stringer, L.C.; Warren-Thomas, E.; Agus, F.; Hamer, K.; Pettorelli, N.; Hariyadi, B.; Hodgson, J.; Kartika, W.D.; Lucey, J.; McClean, C.; Nurida, N.L.; Saad, A.; Hill, J.K.	Restoration Ecology	2020	10.1111/rec.13133	4	"In this study we interview a range of policymakers, academics, and non-governmental organization (NGO) representatives to explore the range of perspectives on the restoration of Indonesia's tropical peatlands-key global ecosystems that have undergone large-scale degradation."
1	Information Sources and Constraints to Climate Change Adaptation amongst Smallholder Farmers in Amathole District Municipality, Eastern Cape Province, South Africa	Popoola, O.O.; Yusuf, S.F.G.; Monde, N.	Sustainability	2020	10.3390/su12145846	4	"This study aimed to identify smallholder farmers' sources of climate change information and constraints to their coping and adaptation."
1	NIMBY, YIMBY, or something else? Geographies of public perceptions of shale gas development in the Marcellus Shale	Zanocco, C.; Boudet, H.; Clarke, C.E.; Stedman, R.; Evensen, D.	Environmental Research Letters	2020	10.1088/1748-9326/ab7d01	4	"Using precisely geocoded well and survey data, we explore the interplay of political ideology, proximity and place in the context of public attitudes toward unconventional oil and natural gas development (UOGD) in the Marcellus Shale region of southern New York and northern Pennsylvania."

1	Post-survey Likert constructions: an adaptive method for generalizing perceptions of environmental variability	Doubleday, K.F.; Crews, K.A.; Eisenhart, A.C.; Young, K.R.	Geojournal	2020	10.1007/s10708-020-10251-y	4	We propose here post-survey Likert constructions (PSLCs), using semi-structured interviews to construct a five-point scale system from multiple household responses after the completion of interviews. This method is able to capture the natural variability in the population using the respondents' own language and characterizations of phenomena. We applied this method to measure the perceived environmental variability of residents living in a dynamic flooding landscape in the Okavango Delta, Botswana.
1	Does the simplification of activity systems produce landscape homogenization?	Morteo-Montiel, S.; Simms, S.R.; Porter-Bolland, L.; Bonilla-Moheno, M.	Environment Development And Sustainability	2020	10.1007/s10668-020-00839-2	4	"We studied changes in land-use strategies employed by rural communities, as well as their impact on the landscape in Atzalan, Mexico."
1	Open access post-harvest grazing and farmers' preferences for forage production incentives in Ethiopia	Teklewold, H.; Mekonnen, A.; Gebrehiwot, T.; Bezabih, M.	Land Use Policy	2020	10.1016/j.landusepol.2020.104685	4	"This paper analyzes farmers' perceptions about post-harvest free grazing on agricultural lands and identifies incentives that motivate forage production, to help inform forage development and policy."
1	Welfare economics and wicked problems in coastal and marine governance	Groeneveld, R.A.	Marine Policy	2020	10.1016/j.marpol.2020.103945	4	"This article reviews the simplifying assumptions underlying SCBA in four major areas. First, welfare-economics and SCBA assume a utilitarian, consequentialist frame and a clear problem delineation, whereas wicked problems are difficult to define and delineate." SCBA= Social Cost-Benefit Analysis
1	Realising blue growth in the fishing industry in Iceland and Norway: Industry perceptions on drivers and barriers to blue growth investments and policy implications	Saviolidis, N.M.; Davidsdottir, B.; Ilmola, L.; Stepanova, A.; Valman, M.; Rovenskaya, E.	Marine Policy	2020	10.1016/j.marpol.2020.103967	4	"This paper relies on in-depth, semi-structured, elite interviews conducted in Iceland and Norway to reveal the perspectives of the fishing industry regarding the perceived drivers and barriers for investing in blue growth."
1	The street as workspace: Assessing street vendors' rights to trees in Hyderabad, India	Basu, S.; Nagendra, H.	Landscape And Urban Planning	2020	10.1016/j.landurbplan.2020.103818	4	"Drawing from in-depth interviews with 75 street vendors in 11 market streets in the hot Indian city of Hyderabad, we discuss their perceptions of the importance of trees for their daily work and livelihood and describe the challenges that street vendors face in accessing shade in a hot city."
1	Farmer Participation and Institutional Capture in Common-Pool Resource Governance Reforms. The Case of Groundwater Management in California	Mendez-Barrientos, L.E.; DeVincentis, A.; Rudnick, J.; Dahlquist-Willard, R.; Lowry, B.; Gould, K.	Society & Natural Resources	2020	10.1080/08941920.2020.1756548	4	"This paper investigates farmer participation in state-mandated common-pool resource governance."
1	Using Structured Decision-Making Tools With Marginalised Fishers to Promote System-Based Fisheries Management Approaches in South Africa	Gammage, L.C.; Jarre, A.	Frontiers In Marine Science	2020	10.3389/fmars.2020.00477	4	"Building on this previous research, and using causal mapping, fishers mapped out drivers of change in an iterative process in a problem framing exercise which also highlighted hidden drivers of change and feedback loops." Focuses on fisheries management.
1	Photovoice, emergency management and climate change: a comparative case-study approach	Russo, S.; Hissa, K.; Murphy, B.; Gunson, B.	Qualitative Research	2020	10.1177/1468794120934398	4	"We argue that photovoice has the potential to solicit poorly understood rural and Indigenous community member perspectives, thereby augmenting locally relevant, place-based information and, ideally, empowering voices that are often under-represented in municipal and provincial decision-making processes."
1	From garden to store: local perspectives of changing food and nutrition security in a Pacific Island country	Savage, A.; Bambrick, H.; Gallegos, D.	Food Security	2020	10.1007/s12571-020-01053-8	4	"In this study, qualitative research methods were used to explore food and nutrition security (FNS) experiences in a peri-urban, and a remote village, in Vanuatu."
1	REDD plus Across Transboundary Landscapes: A Look into the Opportunities and Challenges of Participatory Forest Management Systems in Receiving Results Based Payments in the Hindu Kush Himalayan Region	Basnet, S.; Karki, B.S.	Small-Scale Forestry	2020	10.1007/s11842-020-09448-3	4	Analyzes the opportunities and challenges of payments for emission reductions in the Hindu Kush Himalaya.
1	How do YouTube videos impact tolerance of wolves?	Casola, W.R.; Rushing, J.; Futch, S.; Vayer, V.; Lawson, D.F.; Cavalieri, M.J.; Larson, L.R.; Peterson, M.N.	Human Dimensions Of Wildlife	2020	10.1080/10871209.2020.1773582	4	"Our experimental study examined how respondents' tolerance for wolves (i.e., attitudes, acceptance, and behavior) changed after viewing wolf related YouTube videos."
1	Factors influencing local people's participation in sustainable forest management	Savari, M.; Damaneh, H.E.; Damaneh, H.E.	Arabian Journal Of Geosciences	2020	10.1007/s12517-020-05519-z	4	The main goal of the present research was to discover the determinant factors of the participation of local communities in sustainable forest management (SFM) in Iran."
1	Farmers' livelihood risks, livelihood assets and adaptation strategies in Rugao City, China	Kuang, F.Y.; Jin, J.J.; He, R.; Ning, J.; Wan, X.Y.	Journal Of Environmental Management	2020	10.1016/j.jenvman.2020.110463	4	"Based on accurately identifying farmers' livelihood risks, this paper investigates the effects of farmers' livelihood assets on their livelihood risks and adaptation strategies."
1	Exploring farmers' perceptions about their depleting groundwater resources using path analysis: implications for groundwater overdraft and income diversification	Hashemi, S.M.; Kinzig, A.; Abbott, J.K.; Eakin, H.; Sedaghat, R.	Hydrogeology Journal	2020	10.1007/s10040-020-02190-2	4	"This research was conducted to explore whether the perceptions of pistachio growers in Rafsanjan Plain, Iran (a global center for pistachio production), on the depleting groundwater resources have led to the conservation of the resources and/or income diversification."
1	Farmer Livelihood Strategies and Attitudes in Response to Climate Change in Agroforestry Systems in Kedougou, Senegal	Papa, C.; Nzokou, P.; Mbow, C.	Environmental Management	2020	10.1007/s00267-020-01302-8	4	Using a qualitative approach and a rural livelihood framework, we analyzed and assessed farmer livelihood strategies, attitudes, and responses to climate change. Results showed that farmers are constantly changing management strategies through flexible and adaptable decision-making to mitigate negative disturbances, but climate change as a primary driver to change cannot be distinguished from other normal challenges that farmers face inter- and intra-annually.
1	Farm households' flood adaptation practices, resilience and food security in the Upper East region, Ghana	Alhassan, H.	Heliyon	2020	10.1016/j.heliyon.2020.e04167	4	"This study employs the multinomial endogenous treatment effect model to examine the effect of flood adaptation strategies on farm households' food security in the Upper East region, Ghana."
1	Adaptive behavior of farmers' livelihoods in the context of human-environment system changes	Yin, S.; Yang, X.J.; Chen, J.	Habitat International	2020	10.1016/j.habitatint.2020.102185	4	"This study constructed a new conceptual framework to analyze farmers' livelihood adaptation and selected Minqin in the arid region of northwest China, as a case to explore farmers' adaptive behaviors and their influencing factors."
1	Perception of Ecosystem Services in Constituting Multi-Functional Landscapes in Slovakia	Bezak, P.; Mederly, P.; Izakovicova, Z.; Moyzeova, M.; Bezakova, M.	Land	2020	10.3390/land9060195	4	"Herein, we evaluate the ecosystem service supply from landscape structures in four different areas of Slovakia and we identify the public preferences for these services."
1	Efficient water management: an analysis for the agricultural sector	Martinho, V.J.P.D.	Water Policy	2020	10.2166/wp.2020.191	4	"In this framework, the main objective of this study is to analyse the water management efficiency of the agricultural sector in the regions (NUTS 2) and countries in the European Union."

1	Finding common ground: agreement on increasing wildfire risk crosses political lines	Hartter, J.; Hamilton, L.C.; Ducey, M.J.; Boag, A.E.; Salerno, J.D.; Christoffersen, N.D.; Oester, P.T.; Palace, M.W.; Stevens, F.R.	Environmental Research Letters	2020	10.1088/1748-9326/ab7ace	6	Location: wildlands urban interfaces in eastern Oregon, US
1	Socio-economic determinants and impact of adopting climate-smart Brachiaria grass among dairy farmers in Eastern and Western regions of Kenya	Maina, K.W.; Ritho, C.N.; Lukuyu, B.A.; Rao, E.J.O.	Heliyon	2020	10.1016/j.heliyon.2020.e04335	4	"This study analyses the socio-economic determinants of adoption and the impact of adopting Brachiaria grass for feed sufficiency and increased milk production."
1	Farmers' perceptions and management of risk in rice/shrimp farming systems in South-West Coastal Bangladesh	Kabir, J.; Cramb, R.; Alauddin, M.; Gaydon, D.S.; Roth, C.H.	Land Use Policy	2020	10.1016/j.landusepol.2020.104577	4	This paper draws on a case study of a typical rice/shrimp farming village in Khulna District to explore: (a) farmers' perceptions of risks and their management responses, (b) risk-return trade-offs within small-, medium-, and large-farm households, and (c) the role of other farm and non-farm activities in mitigating risks to household livelihoods.
1	Barriers and requirements to climate change adaptation of mountainous rural communities in developing countries: The case of the eastern Qinghai-Tibetan Plateau of China	Wang, W.J.; Zhao, X.Y.; Cao, J.J.; Li, H.; Zhang, Q.	Land Use Policy	2020	10.1016/j.landusepol.2019.104354	4	"We conducted an empirical study of the barriers and requirements to adapting to climate change of 539 peasant households in an ecologically vulnerable area of China to enhance their resilience to climate change by improving our understanding of adaptation process and decision-making."
1	Knowledge Management for Climate Change Adaptation to Enhance Urban Agriculture Among Selected Organisations in Zimbabwe	Chisita, C.T.; Fombad, M.	Journal Of Information & Knowledge Management	2020	10.1142/S0219649220500094	6	Urban agriculture
1	Data on farmers' adoption of climate change mitigation measures, individual characteristics, risk attitudes and social influences in a region of Switzerland	Kreft, C.S.; Huber, R.; Wupper, D.J.; Finger, R.	Data In Brief	2020	10.1016/j.dib.2020.105410	4	"We present survey data on the adoption of agricultural climate change mitigation measures collected among 105 farmers in a region in Switzerland in 2019."
1	Local communities' perceptions about the impact of protected areas on livelihoods and community development	Abukari, H.; Mwalyosi, R.B.	Global Ecology And Conservation	2020	10.1016/j.gecco.2020.e00909	4	"In this study, four facets - governance, management, ecological outcomes and social impacts - of conservation of protected areas in East and West Africa were investigated in Tanzania and Ghana, respectively."
1	Generational Local Ecological Knowledge on the Benefits of an Agroforestry Landscape in Mindanao, Philippines	Galang, E.I.N.E.; Vaughter, P.	Asian Journal Of Agriculture And Development	2020	10.37801/ajad2020.17.1.6	4	"Thus, this study highlights age-based local ecological knowledge (LEK) on these agroforestry-based ecosystem services to understand differences in the generational persistence and sources of their LEK."
1	Factors Influencing Farmers' Adoption of Climate-Smart Agriculture in Rice Production in Vietnam's Mekong Delta	Dung, L.T.	Asian Journal Of Agriculture And Development	2020	10.37801/ajad2020.17.1.7	2	Monoculture rice growers.
1	Determinants of farmers' choice adaptation strategies to climate change: evidence from Khyber Pakhtunkhwa Pakistan	Ali, U.; Wang, J.; Ullah, A.; Tan, Y.F.; Nurgazina, Z.; Khan, Z.A.	Pakistan Journal Of Agricultural Sciences	2020		4	"we investigate the factors affecting farm household adaptation to climatic change and constraints to adapt strategies in Khyber Pakhtunkhwa province of Pakistan."
1	Improving site assessment tools in emerging technologies: The case of highway vertical-axis wind turbines in the United States	Kunkel, L.C.; Hall, D.M.	Energy Research & Social Science	2020	10.1016/j.erss.2020.101456	4	"This study uses early-stage stakeholder engagement to examine the non-technical barriers to siting of vertical axis wind turbines (VAWTs) along traffic corridors throughout the United States."
1	Drivers of household and agricultural adaptation to climate change in Vietnam	Duffy, C.; Pede, V.; Toth, G.; Kilcline, K.; O'Donoghue, C.; Ryan, M.; Spillane, C.	Climate And Development	2020	10.1080/17565529.2020.1757397	4	"This study utilises a mixed model ordinal logistic regression on farm household data collected in the Mekong and Red River deltas with the goal of quantifying their impacts on 'planned', in anticipation of gradual climate change, and 'response', to deal with the impacts of sudden onset change, adaptations."
1	Climate Change Views, Energy Policy Support, and Personal Action in the Intermountain West: The Anti-Reflexivity Effect	Givens, J.E.; Hazboun, S.O.; Briscoe, M.D.; Krannich, R.S.	Society & Natural Resources	2020	10.1080/08941920.2020.1769782	3	"Using OLS and logistic regression analysis of survey data from respondents in five states in the US Intermountain West region, we find empirical support for the effect of anti-reflexivity on climate views, energy policy support, and PEBs."
1	Factors driving farmers' knowledge on climate change in a climatically vulnerable state of India	Das, U.; Ghosh, S.	Natural Hazards	2020	10.1007/s11069-020-03973-2	3	The abstract does not mention if the farmers are smallholders.
1	Predictors of global warming risk perceptions among Latino and non-Latino White Americans	Goldberg, M.H.; Gustafson, A.; Ballew, M.T.; Rosenthal, S.A.; Cutler, M.J.; Leiserowitz, A.	Climatic Change	2020	10.1007/s10584-020-02728-z	3	"This study uses two parallel, nationally representative surveys of Latino and non-Latino White Americans to investigate these different levels of risk perception."
1	COVID-19 pandemic, socioeconomic crisis and human stress in resource-limited settings: A case from Bangladesh	Shammi, M.; Bodrud-Doza, M.; Islam, A.M.T.; Rahman, M.M.	Heliyon	2020	10.1016/j.heliyon.2020.e04063	4	"The aim of this article is, therefore, to understand the public perception of socioeconomic crisis and human stress in resource-limited settings of Bangladesh during the COVID-19 outbreak."
1	Who Adopts Agroforestry in a Subsistence Economy?-Lessons from the Terai of Nepal	Dhakal, A.; Rai, R.K.	Forests	2020	10.3390/f11050565	4	"Through this research, carried out in a Terai district of Nepal, we thoroughly examine what influences farmers' choice of agroforestry adoption and what discourages the adoption."
1	Land Use/Land Cover Data of the Urban Atlas and the Cadastre of Real Estate: An Evaluation Study in the Prague Metropolitan Region	Micek, O.; Feranec, J.; Stych, P.	Land	2020	10.3390/land9050153	4	" the aim of this study was to evaluate the thematic content of the Urban Atlas database and data from the Czech cadastre of real estate in the Prague metropolitan region between the years 2006 and 2012 with a focus on the meaning of the nomenclature used by both datasets."
1	When worry about climate change leads to climate action: How values, worry and personal responsibility relate to various climate actions	Bouman, T.; Verschoor, M.; Albers, C.J.; Bohm, G.; Fisher, S.D.; Poortinga, W.; Whitmarsh, L.; Steg, L.	Global Environmental Change-Human And Policy Dimensions	2020	10.1016/j.gloenvcha.2020.102061	3	"The current paper investigates this critical relationship with data from the European Social Survey Round 8 (44,387 respondents from 23 countries)."

1	Increasing the credibility and salience of valuation through deliberation: Lessons from the Global South	Lliso, B.; Mariel, P.; Pascual, U.; Engel, S.	Global Environmental Change-Human And Policy Dimensions	2020	10.1016/j.gloenvcha.2020.102065	4	"In this paper we study the applicability DMV on preference elicitation in a rural Indigenous community in Colombia." DMV= Deliberative monetary valuation
1	The best scientists are the people that's out there: Inuit-led integrated environment and health monitoring to respond to climate change in the Circumpolar North	Sawatzky, A.; Cunsolo, A.; Jones-Bitton, A.; Gillis, D.; Wood, M.; Flowers, C.; Shiwak, I.; Harper, S.L.	Climatic Change	2020	10.1007/s10584-019-02647-8	4	"This study-conducted in partnership with the Inuit community of Rigolet, Nunatsiavut, Canada-aimed to characterize what Inuit value and want monitored to develop a conceptual framework for an Inuit-led integrated monitoring system."
1	Mitigating negative livelihood impacts of no-take MPAs on small-scale fishers	Mizrahi, M.; Duce, S.; Khine, Z.L.; MacKeracher, T.; Maung, K.M.C.; Phyu, E.T.; Pressey, R.L.; Simpfendorfer, C.; Diedrich, A.	Biological Conservation	2020	10.1016/j.biocon.2020.108554	4	"In this study, we developed a systematic method to identify individuals who are most vulnerable to being negatively impacted by no-take MPAs through an index that represents individual-level vulnerability." MPA= Marine protected areas
1	Factory-made or farm fresh? Measuring US support for aquaculture as a food technology	Rickard, L.N.; Britwum, K.; Noblet, C.L.; Evans, K.S.	Marine Policy	2020	10.1016/j.marpol.2020.103858	4	"In this study, we explore the factors leading individuals to view aquaculture as factory-made or farm fresh - that is, what predicts acceptance of aquaculture, and how might these variables differ from those previously shown to influence acceptance of other novel food technologies, such as GM food"
1	Yield stability and phenotypic plasticity of Populus spp. clones growing in environmental gradients: I-yield stability under field conditions	Alvarez, J.A.; Cortizo, S.C.; Gyenge, J.E.	Forest Ecology And Management	2020	10.1016/j.foreco.2020.117995	4	"Our objective was to study the productivity and stability of poplar clones across different environmental conditions, and to compare two different methods to characterize yield stability."
1	Policy design for climate change mitigation and adaptation in sheep farming: Insights from a study of the knowledge transfer chain	Concu, G.B.; Atzeni, G.; Meleddu, M.; Vannini, M.	Environmental Science & Policy	2020	10.1016/j.envsci.2020.02.014	3	"This study is an investigation on attitudes towards climate change mitigation and adaptation of three classes of actors: sheep farmers, researchers involved in fields related to sheep farming and extension officers from private companies and public agencies."
1	Energy choices in Alaska: Mining people's perception and attitudes from geotagged tweets	Abdar, M.; Basiri, M.E.; Yin, J.J.; Habibnezhad, M.; Chi, G.Q.; Nemati, S.; Asadi, S.	Renewable & Sustainable Energy Reviews	2020	10.1016/j.rser.2020.109781	4	"This study utilizes information-rich Twitter data to investigate Alaskans' perceptions and opinions on various energy sources and in particular clean energy sources."
1	Adaptation towards climate change impacts among highland farmers in Malaysia	Shaffril, H.A.M.; Idris, K.; Sahharon, H.; Abu Samah, A.; Abu Samah, B.	Environmental Science And Pollution Research	2020	10.1007/s11356-020-08987-8	4	"This study aims to gain more understanding on highland farmers' adaptation towards the impacts of climate change in Malaysia."
1	Productive changes in Brazilian Pampa: impacts, vulnerabilities and coping strategies	Matte, A.; Waquil, P.D.	Natural Hazards	2020	10.1007/s11069-020-03934-9	4	"This study sought to evaluate to what extent the expansion of both soybean cultivation and forestry plantation (tree plantations) over the Pampa biome in southern Brazil may represent a situation of vulnerability for cattle farmers who traditionally occupy these lands."
1	Climate change and adaptation to social-ecological change: the case of indigenous people and culture-based fisheries in Sri Lanka	Galappaththi, E.K.; Ford, J.D.; Bennett, E.M.	Climatic Change	2020	10.1007/s10584-020-02716-3	4	Rural coastal fishery systems in tropical island nations are undergoing rapid change. Using a case study from eastern Sri Lanka, this paper examines the ways in which indigenous Coastal-Vedda fishers experience and respond to such change.
1	Does climate change framing matter? Evidence from an experiment of crop advisors in the Midwestern United States	Singh, A.S.; Church, S.P.; Dang, L.; Hennes, E.P.; Prokopy, L.S.	Climatic Change	2020	10.1007/s10584-020-02703-8	4	"In the current study, we examined whether framing cover crops-a climate change-adaptive practice that enhances soil health-as a way to address that weather extremes rather than climate change would enhance crop advisors' reported likelihood of recommending cover crops to their farmers, particularly among advisors who are skeptical of the existence of climate change."
1	Adaptation to social-ecological stressors: a case study with Indian jujube (Ziziphus mauritiana Lam.) growers of north-western India	Singh, A.; Singh, R.K.; Kumar, A.; Kumar, A.; Kumar, R.; Kumar, N.; Sheoran, P.; Yadav, R.K.; Sharma, D.K.	Environment Development And Sustainability	2020	10.1007/s10668-020-00717-x	4	"In this study, we recorded the perceptions of Indian jujube (ber) growers of Haryana, India, to understand how social-ecological stressors were impacting their livelihoods and how they were responding to the constraints being faced using their own creativity and institutional recommendations."
1	Environmental risks among rice farmers and factors influencing their risk perceptions and attitudes in Punjab, Pakistan	Ahmad, D.; Afzal, M.; Rauf, A.	Environmental Science And Pollution Research	2020	10.1007/s11356-020-08771-8	2	Monoculture rice farmers.
1	A multilevel analysis of the drivers of household water consumption in a semi-arid region	Barnett, M.J.; Jackson-Smith, D.; Endter-Wada, J.; Haeffner, M.	Science Of The Total Environment	2020	10.1016/j.scitotenv.2019.136489	4	"Using multilevel models, we compared attitudinal, demographic, and structural drivers of indoor and outdoor residential water use for a sample of households in Northern Utah."
1	Examining the energy literacy of tourism peasant households in rural tourism destinations	Zhang, J.K.; Zhang, Y.	Asia Pacific Journal Of Tourism Research	2020	10.1080/10941665.2020.1741410	4	"Through questionnaires and interviews, we investigated the energy literacy characteristics of tourism peasant households in rural tourism destinations and distinguished the predictors of energy conservation behavior."
1	Nature connection, experience and policy encourage and maintain adaptation to drought in urban agriculture	Egerer, M.; Lin, B.B.; Diekmann, L.	Environmental Research Communications	2020	10.1088/2515-7620/ab8917	6	Urban community gardens in central coast California.
1	Less meat, more legumes: prospects and challenges in the transition toward sustainable diets in Sweden	Roos, E.; Carlsson, G.; Ferawati, F.; Hefni, M.; Stephan, A.; Tidaker, P.; Witthoft, C.	Renewable Agriculture And Food Systems	2020	10.1017/S1742170518000443	4	"In this paper, we explore a scenario in which meat consumption in Sweden is reduced by 50% and replaced by domestically grown grain legumes."
1	Determinants of perceived risk among artisanal gold miners: A case study of Berber locality, Sudan	Fadlallah, M.A.; Pal, I.; Hoe, V.C.	Extractive Industries And Society-An International Journal	2020	10.1016/j.exis.2020.03.006	3	"The present study applies hierarchical regression analysis to factors influencing perceived risk among artisanal gold miners in the Berber locality of Sudan."

1	How to Close the Gap of Desalinated Seawater for Agricultural Irrigation? Confronting Attitudes between Managers and Farmers in Alicante and Murcia (Spain)	Ricart, S.; Villar-Navascues, R.; Gil-Guirado, S.; Rico-Amoros, A.M.; Arahuetes, A.	Water	2020	10.3390/w12041132	4	This article approaches questions on desalination plant managers and irrigation communities interactions to address water scarcity.
1	Progress in greywater reuse for home gardening: Opportunities, perceptions and challenges	Radingoana, M.P.; Dube, T.; Mazvimavi, D.	Physics And Chemistry Of The Earth	2020	10.1016/j.pec.2020.102853	4	"This work provides a detailed review on greywater reuse in crop production with particular emphasis on community perceptions, challenges and opportunities, lessons from other countries and possible implications on food security."
1	No polarization-Expected Values of Climate Change Impacts among European Forest Professionals and Scientists	Persson, J.; Blennow, K.; Goncalves, L.; Borys, A.; Dutca, I.; Hynynen, J.; Janeczko, E.; Lyubenova, M.; Martel, S.; Merganic, J.; Merganicova, K.; Peltoniemi, M.; Petr, M.; Reboredo, F.H.; Vacchiano, G.; Reyer, C.P.O.	Sustainability	2020	10.3390/su12072659	3	"The present study examines whether forest professionals are more driven by values than scientists are, and if this results in value polarization."
1	Barriers and Facilitators for Adopting Sustainable Soil Management Practices in Mediterranean Olive Groves	Aznar-Sanchez, J.A.; Velasco-Munoz, J.F.; Lopez-Felices, B.; del Moral-Torres, F.	Agronomy-Basel	2020	10.3390/agronomy10040506	4	"The objective of this study is to identify and give a hierarchical structure to the factors that condition the adoption of sustainable practices in the management of agricultural soil."
1	Issues and Opportunities Associated with Trophy Hunting and Tourism in Khunjerab National Park, Northern Pakistan	Rashid, W.; Shi, J.B.; Rahim, I.U.; Dong, S.K.; Sultan, H.	Animals	2020	10.3390/ani10040597	4	"This study was conducted in Khunjerab National Park (KNP) with an aim to analyze comparatively the socioeconomic and ecological impacts of trophy hunting and mass tourism over the last three decades within the context of sustainability."
1	Microgreens: Consumer sensory perception and acceptance of an emerging functional food crop	Michell, K.A.; Isweiri, H.; Newman, S.E.; Bunning, M.; Bellows, L.L.; Dinges, M.M.; Grabos, L.E.; Rao, S.G.; Foster, M.T.; Heuberger, A.L.; Prenni, J.E.; Thompson, H.J.; Uchanski, M.E.; Weir, T.L.; Johnson, S.A.	Journal Of Food Science	2020	10.1111/1750-3841.15075	4	"Using a consumer panel (n = 99), this study evaluated consumer sensory perception and acceptability of six microgreens species (arugula, broccoli, bull's blood beet, red cabbage, red garnet amaranth, and tendril pea), and potential drivers and barriers to consumer acceptance."
1	Adaptation to extreme weather conditions and farm performance in rural Pakistan	Shahzad, M.F.; Abdulai, A.	Agricultural Systems	2020	10.1016/j.agsy.2019.102772	4	"In this article, we analyze farmers' adaptation to extreme weather conditions using climate-smart farm practices (CSFP), and the impact of adoption of these adaptation strategies on farm performance, using recent farm-level data from three agro-ecological zones of Pakistan."
1	Assessing agricultural risk management using historic crop insurance loss data over the ogallala aquifer	Reyes, J.; Elias, E.; Haacker, E.; Kremen, A.; Parker, L.; Rottler, C.	Agricultural Water Management	2020	10.1016/j.agwat.2020.106000	4	"Here, we seek to understand what long-term crop insurance loss data can tell us about agricultural risk management in the Ogallala."
1	Ecosystem services or nature's contributions? Reasons behind different interpretations in Latin America	Pires, A.P.F.; Padgurschi, M.C.G.; de Castro, P.D.; Scarano, F.R.; Strassburg, B.; Joly, C.A.; Watson, R.T.; de Groot, R.	Ecosystem Services	2020	10.1016/j.ecoser.2020.101070	4	"We, therefore, performed a data-based study to explore the potential explanations for the use and perceptions of the differences between the ES and NCP terms." ES= Ecosystem services; NCP= Nature's contributions to people
1	Valuing local perspectives on invasive species management: Moving beyond the ecosystem service-disservice dichotomy	Tebboth, M.G.L.; Few, R.; Assen, M.; Degefu, M.A.	Ecosystem Services	2020	10.1016/j.ecoser.2020.101068	4	"the paper explores how socially-differentiated populations understand the causes and consequences of a plant invasion and express preferences for often contrasting management interventions."
1	Climate change and traditional upland paddy farming: a Philippine case study	Soriano, M.A.; Herath, S.	Paddy And Water Environment	2020	10.1007/s10333-019-00784-5	4	"This paper is a case study on the Ifugao Rice Terraces of the Philippines, a centuries-old farming system whose success is dependent on the year-round allocation of water resources following an intricate agricultural cycle."
1	Perceptions and responses to rising salinity intrusion in the Mekong River Delta: What drives a long-term community-based strategy?	Khong, T.D.; Loch, A.; Young, M.D.	Science Of The Total Environment	2020	10.1016/j.scitotenv.2019.134759	2	Monoculture rice farmers.
1	Farmers' adaptation to drought risk through farm-level decisions: the case of farmers in Dehloran county, Southwest of Iran	Delfiyan, F.; Yazdanpanah, M.; Forouzani, M.; Yaghoubi, J.	Climate And Development	2020	10.1080/17565529.2020.1737797	4	"The aim of this study was thus to investigate farmers' ongoing adaptation measures and to identify factors influencing their choice of methods."
1	Water, ice, and climate change in northwest Greenland	Nuttall, M.	Wiley Interdisciplinary Reviews-Water	2020	10.1002/wat2.1433	4	This article argues on the inclusion of Inuit organizations into environmental governance on the coastal areas of northwest Greenland, who are campaigning for protected marine areas based on community monitoring systems for wildlife management.
1	Can an innovation platform support a local process of climate-smart agriculture implementation? A case study in Cauca, Colombia	Osorio-Garcia, A.M.; Paz, L.; Howland, F.; Ortega, L.A.; Acosta-Alba, I.; Arenas, L.; Chirinda, N.; Martinez-Baron, D.; Findji, O.B.; Loboguerrero, A.M.; Chia, E.; Andrieu, N.	Agroecology And Sustainable Food Systems	2020	10.1080/21683565.2019.1629373	4	"The main purpose of this work was analyzing how an innovation platform can foster and provide a basis for multi-actor collaboration in order to enable climate-smart agriculture (CSA) implementation at the local level."
1	Employing a value-belief-norm framework to gauge Carthage residents' intentions to support sustainable cultural heritage tourism	Megeirhi, H.A.; Woosnam, K.M.; Ribeiro, M.A.; Ramkissoonee, H.R.; Denley, T.J.	Journal Of Sustainable Tourism	2020	10.1080/09669582.2020.1738444	4	"In light of the recent conflicts in Carthage over land use, cultural heritage preservation, and sustainable tourism, this work utilized a value-belief-norm (VBN) theoretical framework to consider psychological antecedents of residents' behavioral intentions to support cultural heritage tourism."
1	Socio-demographic drivers of the risk-taking propensity of micro farmers Evidence from the Czech Republic	Spicka, J.	Journal Of Entrepreneurship In Emerging Economies	2020	10.1108/JEEE-09-2019-0143	4	"The purpose of this study is to find socio-demographic determinants of the risk-taking propensity of the Czech micro farms, controlling for the type of farming."

1	Simultaneous adoption of risk management strategies to manage the catastrophic risk of maize farmers in Bangladesh	Adnan, K.M.M.; Ying, L.; Sarker, S.A.; Yu, M.; Eliw, M.; Sultanuzzaman, M.R.; Huq, M.E.	Geojournal	2020	10.1007/s10708-020-10154-y	2	Monoculture maize farmers
1	Confident, capable and world changing: teenagers and digital citizenship	Green, L.	Communication Research And Practice	2020	10.1080/22041451.2020.1732589	4	"Based on the UN Convention on the Rights of the Child framework, and informed by critical analysis of discourses around digital citizenship, this paper explores the competencies already demonstrated by many adolescents and addresses the priorities identified by policymakers."
1	Local Perceptions of Water-Energy-Food Security: Livelihood Consequences of Dam Construction in Ethiopia	Gebreyes, M.; Bazzana, D.; Simonetto, A.; Muller-Mahn, D.; Zaitchik, B.; Gilioli, G.; Simane, B.	Sustainability	2020	10.3390/su12062161	4	"Here, we present a community-scale perspective on large W-E-F oriented infrastructure. In doing so, we link the current debate on the nexus with alternative approaches to embrace questions of water distribution, political scales, and resource management."
1	Crop Pollination in Small-Scale Agriculture in Tanzania: Household Dependence, Awareness and Conservation	Sawe, T.; Nielsen, A.; Eldegard, K.	Sustainability	2020	10.3390/su12062228	4	"Here, we have assessed how local farmers in northern Tanzania depend on insect-pollinated crops for household food and income, and to what extent farmers are aware of the importance of insect pollinators and how they can conserve them."
1	Government extension, agroecology, and sustainable food systems in Belize milpa farming communities: A socio-ecological systems approach	Drexler, K.A.	Journal Of Agriculture Food Systems And Community Development	2020	10.5304/jafscd.2020.093.001	4	"Agriculture extension, a government service in Belize, can promote additional agroecological practices to address food and livelihood insecurities in milpa communities. This study examines perceptions of these practices from milpa farmers and agricultural extension officers in Belize using a socio-ecological systems (SES) framework."
1	Hydrological Model Application in the Sirba River: Early Warning System and GloFAS Improvements	Passerotti, G.; Massazza, G.; Pezzoli, A.; Bigi, V.; Zsoter, E.; Rosso, M.	Water	2020	10.3390/w12030620	4	"This study analyzed the performances of GloFAS 1.0 and 2.0 at Garbey Kourou. The model verification was performed using continuous and categorical indices computed according to the historical flow series and the flow hazard thresholds."
1	People with Different Educational Attainment in Washington, DC, USA have Differential Knowledge and Perceptions about Environmental Issues	Richardson, M.L.; Milton, A.D.; Harrison, E.	Sustainability	2020	10.3390/su12052063	3	"We predicted that people's knowledge and perceptions about the interconnectedness of natural resources, climate change, economics, and socio-cultural well-being would differ among demographic groups in Washington, DC, USA, so we conducted surveys to test that prediction."
1	Localized Floods, Poverty and Food Security: Empirical Evidence from Rural Pakistan	Ali, A.; Rahut, D.B.	Hydrology	2020	10.3390/hydrology7010002	4	"This study examines the impact of localized floods on the livelihood of farmers in Pakistan using a cross-sectional data set collected from 812 households."
1	Living Smallholder Vulnerability: The Everyday Experience of Climate Change in Calakmul, Mexico	Green, L.; Schmook, B.; Radel, C.; Mardero, S.	Journal Of Latin American Geography	2020	10.1353/lag.2020.0028	4	Our research explored how residents of Calakmul, Mexico, perceived and experienced their own vulnerability to climate change.
1	Local livelihoods and land users' perceptions of land degradation in northwest Tunisia	Jendoubi, D.; Hossain, M.S.; Giger, M.; Tomicevic-Dubljevic, J.; Ouessar, M.; Liniger, H.; Speranza, C.I.	Environmental Development	2020	10.1016/j.envdev.2020.100507	4	"Considering the global call for SLM, and due to a lack of studies on land degradation (LD) in Tunisia, we aimed to explore the livelihoods of farmers, their livelihoods strategies and perceptions about LD and land management, in order to design SLM in rural areas in Tunisia."
1	Promoting Sustainability in Public Natural-Resource Agencies: Insights from the USDA Forest Service	Ma, Z.; Steele, D.; Cutler, A.; Newcomb, K.	Journal Of Forestry	2020	10.1093/jofore/fvz067	3	"We analyzed survey data from 8,875 USDA Forest Service employees to assess their knowledge, attitudes, behaviors, and perceived opportunities and constraints for promoting broadly defined sustainability."
1	Critical areas linking the supply and demand of cultural ecosystem services: Accessibility and geological disasters	Fu, B.; Xu, P.; Wang, Y.K.; Guo, Y.M.; Zhang, Y.X.; Li, S.X.	Global Ecology And Conservation	2020	10.1016/j.gecco.2019.e00839	4	"We developed a framework with which to analyze the relationship between CES provision, benefit, and connection areas." CES= Cultural ecosystem services
1	To Achieve a Sustainable Blue Future, Progress Assessments Must Include Interdependencies between the Sustainable Development Goals	Nash, K.L.; Blythe, J.L.; Cvitanovic, C.; Fulton, E.A.; Halpern, B.S.; Milner-Gulland, E.J.; Addison, P.F.E.; Pecl, G.T.; Watson, R.A.; Blanchard, J.L.	One Earth	2020	10.1016/j.oneear.2020.01.008	4	"To understand the potential implications of this compartmentalized assessment framework, we explore progress evaluations toward SDG 14 (Life below Water) and intersecting social goals presented in submissions to the UN High-Level Political Forum."
1	Fatalism, Climate Resiliency Training and Farmers' Adaptation Responses: Implications for Sustainable Rainfed-Wheat Production in Pakistan	Mahmood, N.; Arshad, M.; Kaechele, H.; Shahzad, M.F.; Ullah, A.; Mueller, K.	Sustainability	2020	10.3390/su12041650	4	"The aim of this study was to investigate the factors that can potentially affect the adaptation process against climate change. This study focused on wheat farmers and farming systems in the rainfed agroecological zone of Pakistan."
1	Impacts of climate change on livestock and possible adaptations: A case study of the United Kingdom	Wreford, A.; Topp, C.F.E.	Agricultural Systems	2020	10.1016/j.agsy.2019.102737	4	"In this paper, we focus on livestock in the United Kingdom (UK), as an example of a temperate region likely to experience at least moderate changes in climate that will require changes to the way agricultural systems operate. We summarise the projected climate changes in this region, identify the main impacts likely to affect livestock agriculture, and discuss potential adaptation options at the farm level."
7	Understanding the Resilience of Different Farming Strategies in Coping with Geo-Hazards: A Case Study in Chongqing, China	Peng, L.; Tan, J.; Deng, W.; Liu, Y.	International Journal Of Environmental Research And Public Health	2020	10.3390/ijerph17041226	4	"Unlike traditional farmers' behavioral adaptation studies, in this study, we focused on the resilience of farmers' behavioral mechanisms to address local hazards such as geo-hazards."
1	Weather Risk Management in Energy Sector: The Polish Case	Wieczorek-Kosmala, M.	Energies	2020	10.3390/en13040945	4	"The main aim of this paper is to provide an insight into the impact of weather risk on economic activity of companies operating in the energy sector in Poland."
1	Trans-Disciplinary Responses to Climate Change: Lessons from Rice-Based Systems in Asia	Hellin, J.; Balie, J.; Fisher, E.; Kohli, A.; Connor, M.; Yadav, S.; Kumar, V.; Krupnik, T.J.; Sander, B.O.; Cobb, J.; Nelson, K.; Setiyono, T.; Puskur, R.; Chivenge, P.; Gummert, M.	Climate	2020	10.3390/cli8020035	4	"We use our diverse research experiences to describe the emergence of such networks, such as the Direct Seeded Rice Consortium (DSRC) in South and Southeast Asia, and to identify lessons on how to facilitate and strengthen the development of trans-disciplinary responses to climate change." Refers to South-North and South-South partnerships incorporating policy-makers and practitioners.
1	Are we taking farmers seriously? A review of the literature on farmer perceptions and climate change, 2007-2018	Soubry, B.; Sherren, K.; Thornton, T.F.	Journal Of Rural Studies	2020	10.1016/j.jrurstud.2019.09.005	8	"To gauge the state of the field, we reviewed and coded a sample set of papers (n = 105) concerning farmers' perceptions of climate change."

1	Impacts of smallholder agricultural adaptation on food security: evidence from Africa, Asia, and Central America	Lim, K.; Wichmann, B.; Luckert, M.K.; Laderach, P.	Food Security	2020	10.1007/s12571-019-00993-0	4	"In this study we estimate effects of smallholder agricultural adaptation on food security"
1	Diversity and socio-economic aspects of oil palm agroforestry systems on the Allada plateau, southern Benin	Koussihouede, H.; Clermont-Dauphin, C.; Aholoukpe, H.; Barthes, B.; Chapuis-Lardy, L.; Jassogne, L.; Amadji, G.	Agroforestry Systems	2020	10.1007/s10457-019-00360-0	4	The aim of this study is to test how the selection of practices used in young oil palm plantations was linked with the farmer's objectives.
1	Farm households' risk perception, attitude and adaptation strategies in dealing with climate change: Promise and perils from rural Pakistan	Khan, I.; Lei, H.D.; Shah, I.A.; Ali, I.; Khan, I.; Muhammad, I.; Huo, X.X.; Javed, T.	Land Use Policy	2020	10.1016/j.landusepol.2019.104395	3	The abstract does not mention if the farmers are smallholders.
1	Framing vulnerability and coffee farmers' behaviour in the context of climate change adaptation in Nicaragua	Quiroga, S.; Suarez, C.; Solis, J.D.; Martinez-Juarez, P.	World Development	2020	10.1016/j.worlddev.2019.104733	2	Monoculture coffee growers.
1	How farmers perceive the impact of dust phenomenon on agricultural production activities: A Q-methodology study	Taheri, F.; Forouzani, M.; Yazdanpanah, M.; Ajili, A.	Journal Of Arid Environments	2020	10.1016/j.jaridenv.2019.104028	4	"a Q methodology study was undertaken to identify the perception of farmers toward dust phenomenon, in Khuzestan province, Iran."
1	Willingness to pay for mangrove preservation in Xuan Thuy National Park, Vietnam: do household knowledge and interest play a role?	Trung, H.V.; Nguyen, T.V.; Simioni, M.	Journal Of Environmental Economics And Policy	2020	10.1080/21606544.2020.1716854	4	"This study applied double-bounded dichotomous choice contingent valuation method to directly estimate how much locals are willing to pay for mangrove conservation at Xuan Thuy National Park."
1	Biofixation of atmospheric nitrogen in the context of world staple crop production: Policy perspectives	Khan, M.S.; Koizumi, N.; Olds, J.L.	Science Of The Total Environment	2020	10.1016/j.scitotenv.2019.134945	4	"This article discusses the critical implications of perturbations in N cycle caused by excessive use of fertilizers and resulting policy implications as they relate to ecosystem services."
1	Climate Change and Livelihood Vulnerability in Mixed Crop-Livestock Areas: The Case of Province Punjab, Pakistan	Ahmad, M.I.; Ma, H.Y.	Sustainability	2020	10.3390/su12020586	4	"By employing the livelihood vulnerability index (LVI), the Intergovernmental Panel on Climate Change LVI (LVIIPCC), and the livelihood effect index (LEI), this study evaluated livelihood vulnerability in southern Punjab, Pakistan."
1	To what extent is Nepal's community forestry contributing to the sustainable development goals? An institutional interaction perspective	Aryal, K.; Laudari, H.K.; Ojha, H.R.	International Journal Of Sustainable Development And World Ecology	2020	10.1080/13504509.2019.1627681	4	"In this context, we aim to assess how and to what extent Nepal's community forestry (CF) is contributing to achieve the SDGs." SDGs= Sustainable Development Goals
1	Identification and delimitation of areas in need of nature-based solutions. Na approach based on the quality of space in the context of cultural heritage in Krakow	Olczak, B.; Wilkosz-Mamcarczyk, M.; Sosnova, N.	Acta Scientiarum Polonorum-Formatio Circumiectus	2020		6	"The paper focuses on the introduction of nature-based solutions (NBS) into modem cities to control and counteract effects of climate change. The focal point was highly urbanised historic areas."
1	Climate change and maize production in the Vaal catchment of South Africa: assessment of farmers' awareness, perceptions and adaptation strategies	Akanbi, R.T.; Davis, N.; Ndarana, T.	Climate Research	2020	10.3354/cr01628	2	Monoculture maize farmers
1	How the Smart Food Concept Can Lead to the Transformation of Food Systems and Combat Malnutrition: Different Approaches in Africa, Globally, and a Case Study from Myanmar with Lessons Learnt for Creating Behavior Change in Diets	Diama, A.; Anitha, S.; Kane-Potaka, J.; Htut, T.T.; Jalagam, A.; Kumar, P.; Worou, O.N.; Tabo, R.	Hidden Hunger And The Transformation Of Food Systems: How To Combat The Double Burden Of Malnutrition?	2020	10.1159/000507494	4	"As a case study in Myanmar, we compared two approaches to introduce Smart Food - one which directly introduces new products and one which takes a culturally sensitive participatory and inclusive approach."
1	A Critically Reflective Approach to Veganism: Implications for Indigenous Rights and Green social work	Hart, J.	Social Alternatives	2020		4	"This paper provides a critical reflection on my experience of being vegan, that has raised some ethical questions for me about some of the unintended implications of veganism."
1	The strategy of shifting cultivators in West Kalimantan in adapting to the market economy: empirical evidence behind gaps in interdisciplinary communication	Maring, P.	Journal Of Political Ecology	2020		4	"Theoretically, this study indicates the need for communication and synergy between the perspectives of political ecology and cultural ecology in order to understand the socio-politico-economic complexities haunting the village community's alterations in subsistence strategies."
1	Climate change and hunter gatherers in Ireland: problems, potentials and pressing research questions	Warren, G.	Proceedings Of The Royal Irish Academy Section C-Archaeology Celtic Studies History Linguistics Literature	2020	10.3318/PRIAC.2020.120.01	4	"This paper reviews evidence for the potential impact of climate change on the earliest human settlement of Ireland, primarily within the Mesolithic period."
1	Social-ecological Transitions in a Cattle-based Silvopastoral System in Southern Luzon, Philippines	Galang, E.I.N.E.; Calub, B.M.	Journal Of Environmental Science And Management	2020		4	"This study provides critical insights on how natural resource management by communities andpolicies by decision makers should carefully consider their potential impacts in sustaining locally important ecosystem services in the face of rapidly transitioning social-ecological systems."

1	Analysis of eco-environmental vulnerability: implication for bush encroachment and livestock population dynamics of the Teltele Rangeland, Southern, Ethiopia	Fenetahun, Y.; Xu, X.W.; Wang, Y.D.	Applied Ecology And Environmental Research	2020	10.15666/aeer/1805_72557278	4	"This research aimed to analyzing change of grassland area to bush covered area via remote sensing method using NDVI values, temperature, perception, land use change and the local community background knowledge from 1990-2015."
1	Climate Change and Society	Dietz, T.; Shwom, R.L.; Whitley, C.T.	Annual Review Of Sociology, Vol 46	2020	10.1146/annurev-soc-121919-054614	8	Theoretical work about the role of sociology on understanding climate justice topics, among others.
1	Meaning in the face of changing climate risks: Connecting agency, sensemaking and narratives of change through transdisciplinary research	Vanderlinden, J.P.; Baztan, J.; Chouinard, O.; Cordier, M.; Da Cunha, C.; Huctin, J.M.; Kane, A.; Kennedy, G.; Nikulkina, I.; Shadrin, V.; Surette, C.; Thiaw, D.; Thomson, K.T.	Climate Risk Management	2020	10.1016/j.crm.2020.100224	4	"In this paper we use five case studies to analyze how this sensemaking plays out in situations of changing climate risk and changing frames of reference associated with the presence of transdisciplinary scientists."
1	Groundwater Salinity Susceptibility Mapping Using Classifier Ensemble and Bayesian Machine Learning Models	Mosavi, A.; Hosseini, F.S.; Choubin, B.; Goodarzi, M.; Dineva, A.A.	Ieee Access	2020	10.1109/ACCESS.2020.3014908	4	"In this study, three machine learning models of Stochastic Gradient Boosting (StoGB), Rotation Forest (RotFor), and Bayesian Generalized Linear Model (Bayesglm) are developed for building prediction models and their performance evaluated in the delineation of salinity susceptibility maps."
1	Community Perspective on State Forest Management Regime and its Implication on Forest Sustainability: A Case Study of Chobe Forest Reserve, Botswana	Garekae, H.; Lepetu, J.; Thakadu, O.T.; Sebina, V.; Tselaesele, N.	Journal Of Sustainable Forestry	2020	10.1080/10549811.2020.1722171	4	"This paper analyzed local communities' perspectives on the existing management regime for the Chobe Forest Reserve, Botswana."
1	Modeling land use dynamics in the Kesem sub-basin, Awash River basin, Ethiopia	Tessema, N.; Kebede, A.; Yadeta, D.	Cogent Environmental Science	2020	10.1080/23311843.2020.1782006	4	"This study attempted to examine the land use and land cover (LULC) dynamics on this using multi-spectral satellite imageries in Geographical Information System (GIS) in the Kesem sub-basin of the Awash River Basin, Ethiopia. It also attempted to assess the community perceptions on this using field observation."
1	Ex-ante and ex-post coping strategies for climatic shocks and adaptation determinants in rural Malawi	Abid, M.; Ali, A.; Rahut, D.B.; Raza, M.; Mehdi, M.	Climate Risk Management	2020	10.1016/j.crm.2019.100200	3	The abstract does not mention if the farmers are smallholders.
1	Caught off guard: folk knowledge proves deficient when addressing invasive pests in Asian cassava systems	Upadhyay, B.; Burra, D.D.; Nguyen, T.T.; Wyckhuys, K.A.G.	Environment Development And Sustainability	2020	10.1007/s10668-018-0208-x	4	"In this study, we employ qualitative and quantitative methods to assess agro-ecological knowledge and pest management behavior of small-scale cassava growers in rural Vietnam and Laos, when faced with two new biotic threats, i.e., the invasive cassava mealybug Phenacoccus manihoti and cassava witches broom disease."
1	Public Perceptions of Energy Scarcity and Support for New Energy Technologies: A Western US Case Study	Buylova, A.; Steel, B.S.; Simon, C.A.	Energies	2020	10.3390/en13010238	4	"This study examines public concern for energy security and support for public investment in new energy technologies."
1	Do shrubs improve reproductive chances of neighbors across soil types in drought?	Swanson, E.K.; Sheley, R.L.; James, J.J.	Oecologia	2020	10.1007/s00442-019-04559-x	4	"Our primary study objective is to test if nurse shrubs act as reproductive micro-refugia across soil types, by improving reproductive potential of perennial bunchgrass neighbors subjected to severe drought."
1	Status and attitude of local communities towards the Grey Golf (Canis Lupus Linnaeus, 1758) in Lower Dir District, Khyber Pakhtunkhwa, Pakistan	Khan, T.U.; Luan, X.; Khan, W.; Ahmad, S.; Mannan, A.; Shah, S.; Iqbal, A.; Ammara, U.; Din, E.U.; Khan, H.	Applied Ecology And Environmental Research	2020	10.15666/aeer/1801_129139	4	"This study was carried out in December 2016 to determine the status and nature of human-wolf conflict in the study area."
1	Trends in the National and Regional Transitional Dynamics of Land Cover and Use Changes in Romania	Petrisor, A.I.; Sirodoev, I.; Ianos, I.	Remote Sensing	2020	10.3390/rs12020230	4	"This study aimed to look at the land cover and use changes in Romania by their transitional dynamic using Coordination of Information on the Environment (CORINE) data in an attempt to identify long-term spatially and temporally consistent trends."
1	Adaptive decision-making under conditions of uncertainty: the case of farming in the Volta delta, Ghana	Sarku, R.; Dewulf, A.; van Slobbe, E.; Termeer, K.; Kranjac-Berisavljevic, G.	Journal Of Integrative Environmental Sciences	2020	10.1080/1943815X.2020.1729207	4	"To fill this gap and add to the literature on adaptive decision-making, we addressed the central question: what are the existing patterns of farming decision-making under uncertain rainfall conditions, and which decision-making strategies are adaptive? We developed an adaptive decision-making framework to investigate the behavior of farmers under variable rainfall conditions in Ghana's Volta delta in the Ada East District."
1	How Can Intentionality and Path Dependence Explain Change in Water-Management Institutions in Uzbekistan?	Hamidov, A.; Kasymov, U.; Salokhiddinov, A.; Khamidov, M.	International Journal Of The Commons	2020	10.5334/ijc.947	4	"We review historical and contemporary literature on change in water-management institutions in post-socialist Uzbekistan, exploring the dynamics of change of formal institutions in irrigation-water management there by analyzing relationships between the perceptions and beliefs of policymakers, policy interventions they undertake, and the consequences that these seem to have on resource-use practices."
1	Farming in the Face of Uncertainty: How Colombian Coffee Farmers Conceptualize and Communicate Their Experiences With Climate Change	Lambert, N.J.; Eise, J.	International Journal Of Communication	2020		2	"This study lays the groundwork for future adaptation communication efforts by analyzing 45 in-person, in-depth interviews of coffee farmers in Risaralda, Colombia."
1	Managing New Risks of and Opportunities for the Agricultural Development of West-African Floodplains: Hydroclimatic Conditions and Implications for Rice Production	Bossa, A.Y.; Hounkpe, J.; Yira, Y.; Serpantie, G.; Lidon, B.; Fusillier, J.L;. Sintondji, L.O;. Tondoh, J.M.E.; Diekkruger, B.	Climate	2020	10.3390/cli8010011	4	"This study assesses the hydroclimatic risks and implications of floodplain climate-smart rice production in southwestern Burkina Faso in order to make informed decisions regarding floodplain development."
1	Farmers' Risk Cognition, Risk Preferences and Climate Change Adaptive Behavior: A Structural Equation Modeling Approach	He, R.; Jin, J.J.; Kuang, F.Y.; Zhang, C.Y.; Guan, T.	International Journal Of Environmental Research And Public Health	2020	10.3390/ijerph17010085	3	This article does not mention if the farmers are smallholders.
1	Exploring perspectives in assessing the quality of governance of the Reducing Emissions from Deforestation and Forest Degradation (REDD plus) pilot project in Cambodia: Use of Q Methodology	Nhem, S.; Lee, Y.J.	Journal Of Mountain Science	2020	10.1007/s11629-018-5301-y	4	"this study aimed to assess the perceptions of local stakeholders towards the quality of governance of the first community forest REDD+ pilot project in Cambodia, employing Q-methodology."

1	Learning from Local Perceptions for Strategic Road Development in Cambodia's Protected Forests	Riggs, R.A.; Langston, J.D.; Sayer, J.; Sloan, S.; Laurance, W.F.	Tropical Conservation Science	2020	10.1177/1940082920903183	4	"We examined local perspectives on road development within Cambodia's Keo Seima Wildlife Sanctuary to explore opportunities for optimizing conservation and development outcomes."
1	Opportunities and challenges for seasonal climate forecasts to more effectively assist smallholder farming decisions	Chisadza, B.; Mushunje, A.; Nhundu, K.; Phiri, E.E.	South African Journal Of Science	2020	10.17159/sajs.2020/4649	8	"Therefore, the objective of this paper was to review how smallholder farmers make decisions on farming practices based on SCFs and the challenges and opportunities thereof."
1	Climate change adaptation by subsistence and smallholder farmers: Insights from three agro-ecological regions of Nepal	Karki, S.; Burton, P.; Mackey, B.	Cogent Social Sciences	2020	10.1080/23311886.2020.1720555	4	"We used case study data to examine whether and how subsistence-oriented smallholder farmers in three agro-ecological zones of Nepal (Terai, Hill, and Mountain) are developing and implementing adaptation strategies."
1	Beyond Spiritual Focus: Climate Change Awareness, Role Perception, and Action among Church Leaders in Nigeria	Nche, G.C.	Weather Climate And Society	2020	10.1175/WCAS-D-19-0001.1	3	"This study explored the role of church leaders in addressing climate change with a focus on Catholic, Anglican, and Pentecostal churches in Nigeria."
1	The role of indigenous knowledge (IK) in adaptation to drought by agropastoral smallholder farmers in Uganda	David, M.; Bernard, B.; Anthony, E.; Michael, M.S.; James, W.; Andrew, A.; Stephen, K.; Zakia, N.; Claire, N.	Indian Journal Of Traditional Knowledge	2020		4	"The objectives were: (i) to examine the agro pastoral farmer's perceptions of drought indicators and associated impacts and (ii) determinants for the adoption of indigenous knowledge drought adaptation responses."
1	Ready, willing, and able? USDA field staff as climate advisors	Wiener, S.; Roesch-McNally, G.E.; Schattman, R.E.; Niles, M.T.	Journal Of Soil And Water Conservation	2020	10.2489/jswc.75.1.62	3	"In this study, we conducted a survey of NRCS field staff (n = 1,893) and a similar survey of FSA field staff (n = 4,621) to determine the following: (1) how concerned USDA field staff are with both general and specific climate and weather threats and their effect on agriculture and forestry,[...]"
1	The landscape of North American Rangeland Social Science: A Systematic Map	Bruno, J.E.; Jamsranjav, C.; Jablonski, K.E.; Dosamantes, E.G.; Wilmer, H.; Fernandez-Gimenez, M.E.	Rangeland Ecology & Management	2020	10.1016/j.rama.2019.10.005	4	Systematic map about rangeland social science in North America.
1	Are coastal communities able to pay for the protection of fish resources impacted by climate change?	Tulone, A.; Crescimanno, M.; Vrontis, D.; Galati, A.	Fisheries Research	2020	10.1016/j.fishres.2019.105374	4	"The purpose of this study is to examine inhabitants' motivation and their willingness to pay to mitigate the impact of climate change on fish resources."
26	Helices of disaster memory: How forgetting and remembering influence tropical cyclone response in Mauritius	Walshe, R.A.; Adamson, G.C.; Kelman, I.	International Journal of Disaster Risk Reduction	2020	10.1016/j.ijdrr.2020.101901	4	This article examines past experiences and impacts of cyclones in Mauritius, as well as contemporary perceptions of cyclone vulnerability and memories of historical cyclones.
4	IoT-based Irrigation Management for Smallholder Farmers in Rural Sub-Saharan Africa	Nigussie, E.;Olwal, T. ;Musumba, G.;Tegegne, T.;Lemma, A.;Mekuria, F.	Procedia Computer Science	2020	10.1016/j.procs.2020.10.015	4	In this work, IoT-based irrigation management system is proposed after investigating problems of irrigated farmlands in three SSA countries, Ethiopia, Kenya, and South Africa as case studies.
11	Reflections on conspicuous sustainability: Creating Small Island Dependent States (SIDS) through Ostentatious Development Assistance (ODA)?	Grydehø,j A.;Kelman, I.	Geoforum	2020	10.1016/j.geoforum.2020.08.004	4	This paper uses the concept of 'conspicuous sustainability' as a framework for understanding the propensity for aid to be directed toward small island territories.
4	Sustainable Architecture, Alternative Concepts and Waste Reduction	George, A.		2020	10.1016/B978-0-12-803581-8.10700-3	4	This article is about sustainable architecture
1	Climate services in the UK Met office - challenges and solutions	Hewitt, C.D.	Journal of Southern Hemisphere Earth Systems Science	2020	10.1071/ES19030	4	This article provides examples of the UK Met Office's international climate service activities in Commonwealth small island states, China and Europe, highlighting specific challenges. Based on experiences developing and delivering climate services and collaborating with a range of actors, some approaches that help overcome, or at least reduce, these challenges include undertaking focused user engagement, collaboration and partnerships, developing prototypes and conducting trials of these prototypes with the users, evolving the science and the services based on the users' needs to better serve societal needs.
1	Stakeholder's (natural) hazard awareness and vulnerability of small island tourism destinations: a case study of Malta	Kennedy, V.; Crawford, K.R.; Main, G.; Gauci, R.; Schembri, J.A.	Tourism Recreation Research	2020	10.1080/02508281.2020.1828554	4	With tourists increasingly travelling to destinations in locations of varying risk, this paper explores the intersections of stakeholder's (natural) hazard awareness and resulting vulnerability of small island tourism destinations utilising Malta as a case study setting, focusing on decision- and policy-making dimensions.
10	Evidence of Climate Change Engagement Behaviour on a Facebook Fan-Based Page	Deo, K.; Prasad, A.A.	Sustainability	2020	10.3390/su12177038	4	In this study, we investigate the engagement behaviour of users on a Facebook fan-based page titled "Global Climate Change Awareness" by analysing user insights data for two years starting from April 2018 to April 2020.
1	What makes an environmental trust fund successful? A case study of the Maldives	Shumais, M.; Mohamed, I.	Climatic Change	2020	10.1007/s10584-020-02700-x	4	This study evaluates the Climate Change Trust Fund (CCTF) of the Maldives as a case in point. Experiences from the energy component of the CCTF indicate that while technology transfer is needed, the project approach did not help to overcome the lack of human resource capacity to manage the transition to renewable energy in Thinadhoo.
10	Assessing the local perception of climate change in a small island: a case study	Royuela, J.B.; Hervias-Parejo, S.; Ambros, B.; de la Cruz, A.; Gil, A.	International Journal of Global Warming	2020	10.1504/IJGW.2020.110211	6	This study was undertaken on Corvo (Azores).
2	Visualizing coastal risks in the Fraser River Delta	Lokman, K.	Journal de la Societe des Oceanistes	2020	10.4000/jso.11136	4	In this context, this article examines how geospatial analysis, mapping and visualization can help build critical awareness to ensure that decision-makers and the general public have the knowledge and tools to make informed decisions on coastal adaptation.
2	The nexus of climate change and hotel management in Malaysia: An exploratory study	Mat, N.H.N.; Zabidi, Z.N.; Yusof, Y.; Salleh, H.S.; Mohamed, W.N.; Yusof, Y.M.	International Journal of Sustainable Society	2020	10.1504/IJSSOC.2020.105018	3	This study aims to investigate the perceptions among hotel managers in Kapas Island, Malaysia on the climate change impact to their hotel operation.
3	Examining Climate Change, Tourism, and Sustainability in Small Islands, with Reference to the Balearic Islands, the Caribbean Islands, and the Pacific Islands.	Rujita, B. F.	Gadjah Mada Journal of Tourism Studies	2020	10.22146/gamajts.v3i1.68446	4	In this case, the study seeks to determine the extent to which tourism sustainability on small islands is threatened by climate change.
3	Community perceptions of climate-change vulnerability in Seychelles and some considerations on data and methodological gaps	Etongo, D.; Vel, T.; Port-Louis, A.	Zenodo	2020		4	In order to assess community perceptions on climate change vulnerability, this study utilizes data from the Ecosystem Based Adaptation (EbA) South Project in Seychelles, and at the same time highlights some data and methodological gap.

3	Perception of effect of climate change and adaptation strategies of beekeepers of Welmera district, Ethiopia.	Biyena, L. W.	Zenodo	2020	10.5281/zenodo.4059140	4	This study identifies factors affecting smallholder beekeepers' decisions to choose strategies to adapt to climate change in Welmera District, Oromia regional state, Ethiopia.
3	Te taiao, te tinana, e rua, e rua: the environment and the human body	Morris, H. W.	Cadernos de Linguística	2020	10.25189/2675-4916.2020.v1.n3.id227	4	The title of this paper reflects a Māori perspective to the world we live and move in and our interaction with the environment.
3	The 2016 Water Crisis in San Andres Island: An Opportunity for Change? ; La crisis del agua del 2016 en San Andrés islas: Una oportunidad para el cambio?	Velásquez, C.	Ciencia Política	2020	10.15446/cp.v15n29.86373	4	This study analyzed the crisis response and explored, in the short term, whether there was a change in access to water.
3	Adaptation of Acupuncture and Traditional Chinese Herbal Medicines Models Because of Climate Change	Sun, W.; Shahrajabian, M. H.; Khoshkharam, M.; Cheng, Q.	Journal of Stress Physiology & Biochemistry	2020		8	Literature search was conducted in Medline, Research gate, Scopus, Pubmed and Google scholar databases. The keywords were climate change, acupuncture and traditional Chinese medicine and health benefits.
3	Assessment of smallholder farmers' vulnerability to climate change in Ogun Stata, Nigeria	Oguntoye Titilayo, O.; Arowolo Olayinka, V.	Russian Journal of Agricultural and Socio-Economic Sciences	2020	10.18551/rjoas.2020-06.16	4	This study investigated the assessment of smallholder farmers' vulnerability to climate change in Ogun State, Nigeria.
3	Adaptation strategies by paddy-growing farmers to mitigate the climate crisis in Hyderabad-Karnataka region of Karnataka state, India.	Shanabhoga, M. B.;Bommaiah, K.; Suresha, S. V.; Dechamma, S.	International Journal of Climate Change Strategies and Management.	2020	10.1108/ijccsm-01-2020-0010	4	The purpose of this paper is to consider the climatic variables and evaluate the role of non-climatic factors that delicately influence agriculture.
3	Genotype by Environment interactions for egg number and egg weight of five dual-purpose chicken breeds in different zones of Oromia region in Ethiopia.	de Kinderen, M. A. J.; Sölkner, J.; Mészáros, G.; Alemu, S. W.; Esatu, W; Bastiaansen, J. W.; Dessie, T.	Acta Fytotechnica et Zootechnica	2020	10.15414/afz.2020.23.mi-fpap.205-213	4	A survey among Ethiopian poultry smallholders showed egg sale being the most important purpose of keeping village chickens in Oromia.
3	Preparing Our Home by reclaiming resilience: Lessons from Lil'wat Nation, Siksika Nation and Mohawk Nation at Akwesasne, Canada.	Yumagulova, L.; Woman-Munro, D. Y. O.; Gabriel, C.; Francis, M.; Henry, S.; Smith, A.; Ostertag, J.	Nordic Journal of Comparative and International Education (NJCIE)	2020	10.7577/njcie.3626	4	Drawing on three POH case studies, this article seeks to answer the following question: How can community-led decolonial educational processes help reclaim Indigenous youth and community resilience?
3	Climate services in the UK Met Office–challenges and solutions.	Hewitt, C. D.	Journal of Southern Hemisphere Earth Systems Science	2020		4	This article provides examples of the UK Met Office's international climate service activities in Commonwealth small island states, China and Europe, highlighting specific challenges.
3	Information Barriers to Adoption of Agricultural Technologies: Willingness to Pay for Certified Seed of an Open Pollinated Maize Variety in Northern Uganda.	Mastenbroek, A.; Sirutyte, I.; Sparrow, R.	Journal of Agricultural Economics	2020	10.1111/1477-9552.12395	4	We examine smallholder farmers' willingness to pay for agricultural technology and whether information is a constraint to adoption of certified maize seed in Northern Uganda.
3	Pests and diseases of trees in Africa: A growing continental emergency.	Graziosi, I.; Tembo, M.; Kuate, J.; Muchugi, A.	Plants, People, Planet	2020	10.1002/ppp3.31	4	Here we provide an updated and comprehensive overview of insect pests and pathogens targeting natural and planted forests in Africa, and raise awareness of this growing emergency.
3	Biodiversity of neglected and underutilized fruits of Nepal: a review	Atreya, P. N.; Shrestha, J.	Fundamental and Applied Agriculture	2020	10.5455/faa.122860	8	To assess their diversity a review has been done.
3	Effect of Village Savings and Loan Associations on adoption of index-based crop insurance under limited liabilities.	Ndagijimana, M.; van Asseldonk, M.; Kessler, A.; Ndimubandi, J.	Journal of Agriculture and Rural Development in the Tropics and Subtropics	2020	10.17170/kobra-202002281031	4	A household survey and focus group discussions were conducted to quantify the general determinants of an index-based crop insurance adoption under limited liabilities in Burundi, and specifically the effect of existing Village Savings and Loan Associations (VSLAs).
3	Security Challenges for Small Island Developing States: the case of Cabo Verde ; Desafios para la seguridad de los Pequeños Estados Insulares en Desarrollo: el caso de Cabo Verde ; Desafios de segurança para os pequenos Estados insulares em desenvolvimento: o caso de Cabo Verde	Madeira, J.P.	Revista de Relaciones Internacionales, Estrategia y Seguridad	2020	10.18359/ries.3756	4	This article is an exploratory, descriptive study, with a qualitative and interdisciplinary approach. It integrates concepts and perspectives of contemporary history, international relations, and security studies.
3	Status, diversity and potential of indigenous and minor vegetables of North-Western Himalayan region	Kumar, S.; Gupta, R. K.; Samnotra, R. K.; & Rattan, P. U. J. A.	Indian Horticulture	2020		4	Article about Indigenous (Traditional) vegetables.
3	Landscape reading under "ethno" aspect: a bibliographic study.	Ribeiro, K. V.; Ribeiro, K. V.; Albuquerque, E. L. S.; de BARROS, R. F. M.	Rev Bras Geog Fis	2020	10.26848/rbgf.v13.4.p1914-1934	4	Consisting of a recent theme, which has been receiving notoriety, the goal was to present an overview about the referred subject, analyzing its Evolution between the years 2009 to 2019, in order to verify how it has been proposed and discussed by scholars around the world.

3	What does ‘quality’ mean in the context of rural extension and advisory services? ; ¿Qué significa ‘calidad’ en el contexto de la extensión rural y los servicios de asesoramiento técnico?	Landini, F.	Agronomía Colombiana	2020	10.15446/agron.colomb.v38n1.81738	4	This article aims to clarify the concept of quality of rural extension and to develop a preliminary theoretical framework.
3	Review on Perception and Adaptation Strategies of Smallholder Farmers’ to Climate Change in Ethiopia	Kenea, T.	International Affairs and Global Strategy	2020		8	This paper was prepared through wide spread review of empirical evidence's. Hence ,this paper reviews the empirical literature on smallholder farmers’ perceptions and adaptation strategies of climate change in Ethiopia with specific objectives of to review the Smallholder framers’ perception to climate change, to identify climate change adaptation strategies used by Smallholder farmers’ and to review factors that determine smallholder farmers choice of climate change adaptation strategies in Ethiopia.
3	Phenology of flora components in the use of natural and traditional medicine in the community of Verraco, Santiago de Cuba, Cuba.	Castell Puchades, M. Á.; Revilla Gongora, Y.; Polanco Durán, G.; Baró Bou, Y.	Revista Cubana de Ciencias Forestales	2020		4	The objective of the work was to present the flowering and fruiting patterns of flora species that are components of natural and traditional medicine in the coastal community of Verraco, which belongs to the Baconao Biosphere Reserve.
3	Determinants of the Adoption of Climate-Smart Agricultural Practices in Siyadebrina Wayu District, North Shewa, Ethiopia	Kifle, T.	International Journal of African and Asian Studies	2020	10.7176/JAAS/68-08	4	The objective of this study was to examine the determinants of adoption of climate smart agricultural practices.
3	Evaluation of climate change adaptation in the energy generation sector in Colombia via a composite index—A monitoring tool for government policies and actions.	Pineda, A. A. L.; Rojas, O. A. V.; Jonathan, M. P.; Sujitha, S. B.	Journal of environmental management	2020	10.1016/j.jenvman.2019.109453	4	The aim of the article is to evaluate the national adaptation to climate change in the energy generation sector in Colombia via a composite index.
3	Impact of environmental factors on trend of milk production: a study based in Batticaloa district, Sri Lanka.	Santhirakumar, S.; Narmilan, A.	Lalbhai Dalpatbhai Institute of Indology	2020		4	Therefore, the present study was aimed to determine the correlation between environmental conditions such as atmospheric temperature and rainfall on milk production, influence of management factors on cattle and buffalos in Batticaloa District in Sri Lanka by using descriptive analysis.
3	Eco Art: Bamboo and Silat Spirituality in the Integrated Space Design.	Poerwoko, W.	International Journal of Creative and Arts Studies	2020	10.24821/ijcas.v6i2.3424	4	The Integrated Space Design as an aesthetic manifestation of Eco-Art is an artwork created to address environmental problems occurring in the foothills of Mount Merapi by creating a space that bridges the interactions between humans, between humans and their artificial environment, and between humans and the surrounding natural environment by using bamboo plants as the main media, and silat spirituality as the primary inspiration the local community’s capacity of living, both ecologically and spiritually.
1	Mapping long-term coral reef ecosystems regime shifts: A small island developing state case study	Hafezi, M.; Giffin, A.L.; Alipour, M.; Sahina, O.; Stewart, R.A.	Science of the Total Environment	2020	10.1016/j.scitotenv.2020.137024	4	However, understanding the dynamics of coral reef ecosystems regime shift requires employing an approach capable of dealing with systems being affected by multiple climatic and socio-economic non-climatic pressures as well as an effective treatment of systemic embedded uncertainties. This study applies Fuzzy Cognitive Mapping (FCM) in a participatory stepwise and systematic procedure to reflect dynamic casualties and temporal changes of coral reef ecosystem regime change over a long-time perspective.
1	Climate Change: An Apocalypse for Urban Space? An Ecocritical Reading of Venice Drowned and The Tamarisk Hunter	Akyol, O.	Folklor/Edebiyat-Folklore/Literature	2020	10.22559/folklor.1137	4	In this paper “Venice Drowned” by Kim Stanley Robinson and “The Tamarisk Hunter” by Paolo Bacigalupi will be studied through the theories of ecocriticism in order to demonstrate how cli-fi texts function in providing the reader with an objective perception by elucidating the explicit and belated challenges posed by the problem of climate change.
1	The Impact of Snowstorms, Droughts and Locust Outbreaks on Livestock Production in Inner Mongolia: Anticipation and Adaptation to Environmental Shocks	Crook, D.R.; Robinson, B.E.; Li, P.	Ecological Economics	2020	10.1016/j.ecolecon.2020.106761	4	In this paper, we examine the relationship between environmental shocks and stocking rates in livestock herds in the Inner Mongolian grasslands of northern China. We uniquely examine three types of shocks and how households adapt livestock production strategies in response to each.
2	Missouri Farmers’ Climate Change Perceptions: Relating Changing Trend in Climate Variables to Extreme Weather Events	Aderonmu, A.; Adegoke, J.; Wood A.-M.	International Journal of Climate Change: Impacts and Responses	2020	10.18848/1835-7156/CGP/v13i01/53-64	3	With the use of surveys, this study of Missouri farmers examines their perceptions of climate change and their ability to make a connection between changing climate trends and extreme weather events.
1	Synergy of experts’ and farmers’ responses in climate -change adaptation planning in Serbia	Stricevic, R.; Srdjevic, Z.; Lipovac, A.; Prodanovic, S.; Petrovic-Obradovic, O.; Cosic, M.; Djurovic, N.	Ecological Indicators	2020		4	The objective of the paper is to present farmer and expert rankings of potential adaptation measures in Serbia’s agriculture, to compare the two perspectives, and to propose priority measures.
6	Farmers' perceived efficacy of adaptive behaviors to climate change in the Loess Plateau, China	Shi, X.; Sun, L.; Chen, X.; Wang, L.	Science of the Total Environment	2019	10.1016/j.scitotenv.2019.134217	4	Based on survey data from interviews with farmers in the Loess Plateau, the features of farmers' perceived adaptation efficacy are analyzed.
2	GNSS-R with low-cost receivers for retrieval of antenna height from snow surfaces using single-frequency observations	Rover, S.; Vitti, A.	Sensors (Switzerland)	2019	10.3390/s19245536	4	In this work, beside an overview of key elements of GNSS reflectometry, single-frequency GNSS observations collected by u-blox M8T GNSS receivers and patch antennas from u-blox and Tallysman have been considered for the determination of antenna height from the snowpack surface on a selected test site.
6	Factors influencing the adoption of water conservation technologies by smallholder farmer households in Tanzania	Jha, S.; Kaechele, H.; Sieber, S.	Water (Switzerland)	2019	10.3390/W11122640	4	With the objective to better understand and identify the factors that significantly influence the adoption of WCTs in Tanzania, the study uses survey data from 701 smallholder farmer households and a bivariate logistic regression, to provide, for the first time, a comprehensive model for the adoption of WCTs in Tanzania that includes a range of individual, household, socio-economic, and farmer perception related variables (factors).
2	Sustainability of coastal agriculture under climate change	Gopalakrishnan, T.; Hasan, M.K.; Haque, A.T.M.S.; Jayasinghe, S.L.; Kumar, L.	Sustainability (Switzerland)	2019	10.3390/su11247200	4	In this paper, we discuss all pertinent issues related to the sustainability of coastal agriculture under climate change
6	Agroforestry as a biodiversity conservation tool in the atlantic forest? Motivations and limitations for small-scale farmers to implement agroforestry systems in North-Eastern Brazil	Sagastuy, M.; Krause, T.	Sustainability (Switzerland)	2019	10.3390/su11246932	4	We distributed questionnaires to 75 agroforestry and 64 "conventional agriculture" small-scale farmers working in the northeastern region of the Atlantic Forest to identify the motivations and limitations to implement agroforestry practices. We reveal the four main reasons why farmers worked with agroforestry.
6	Social marketing approach to bring change in water use behaviour of rural people of Punjab, India	Sharma, P.; Kaur, L.; Mittal, R.; Kaur, S.; Kaur, S.	Journal of Water and Climate Change	2019	10.2166/wcc.2018.150	3	The present study is an action research applying a seven-step approach of social marketing to bring change in water use behaviour of rural people of Punjab, India.

2	Environmental change of coastal Sundarbans: Impact on livelihood and standard of living status of indigenous people	Rudra, A.; Chattopadhyay, A.	Environmental Quality Management	2019	10.1002/tqem.21667	4	This study explores both the ways in which residents of communities in the West Bengal and Bangladesh Sundarbans perceive changes in the environment, as well as intergenerational changes in livelihoods to be driven in a large part by environmental changes.
6	Testing for consensus on kyrgyz rangelands: Local perceptions in naryn oblast	Levine, J.; Isaeva, A.; Zerriffi, H.; Eddy, I.M.S.; Foggin, M.; Gergel, S.E.; Hagerman, S.M.	Ecology and Society	2019	10.5751/ES-11222-240436	4	In this study, we use audiovisual primes, structured interview tasks, and consensus analysis to examine the degree of agreement among local agropastoralists of Naryn oblast about (a) the nature of several degradation-ambiguous plant and landscape types found in the area, and (b) indicators of "good" pasture.
6	Transferring water while transforming landscape: New societal implications, perceptions and challenges of management in the reservoir system Franconian Lake District	Daus, M.; Koberger, K.; Gnutzmann, N.; Hertrich, T.; Glaser, R.	Water (Switzerland)	2019	10.3390/w11122469	4	This study investigates the different stakeholder based discourses and challenges around the Franconian Lake District (FLD), a recently constructed large reservoir system in Germany.
6	Evaluating the effectiveness of climate change adaptations in the world's largest Mangrove Ecosystem	Singh, P.K.; Papageorgiou, K.; Chudasama, H.; Papageorgiou, E.I.	Sustainability (Switzerland)	2019	10.3390/su11236655	3	We have used the fuzzy cognitive maps (FCM)-based approach to elicit and integrate stakeholders' perceptions regarding current climate forcing, consequent impacts, and effcacy of the existing adaptation measures
6	Climate change, migration, and vulnerability: Overview of the special issue	Nakayama, M.; Drinkall, S.; Sasaki, D.	Journal of Disaster Research	2019	10.20965/jdr.2019.p1246	4	This study aimed to examine if people in these atoll countries were, are, or will be ready to successfully relocate to foreign countries by re-establishing their lives and livelihoods in a new environment.
6	Setting the table for meat consumers: an international Delphi study on in vitro meat	Tiberius, V.; Borning, J.; Seeler, S.	npj Science of Food	2019	10.1038/s41538-019-0041-0	4	The growing global demand for meat is being thwarted by shrinking agricultural areas, and opposes efforts to mitigate methane emissions and to improve public health. Cultured meat could contribute to solve these problems, but will such meat be marketable, competitive, and accepted? Using the Delphi method, this study explored the potential development of cultured meat by 2027.
6	Non-indigenous fish in protected spaces: Trends in species distribution mediated by illegal stocking	Fernández, S.; Arboleya, E.; Dopico, E.; Ardura, A.; Garcia-Vazquez, E.	Aquatic Conservation: Marine and Freshwater Ecosystems	2019	10.1002/aqc.3238	4	In this study, fish communities were monitored using environmental DNA, electrofishing and anglers' catches as the sources of samples in a mountainous Biosphere Reserve in Asturias (northern Spain), where stocking is forbidden.
6	Learning to see climate change children's perceptions of environmental transformation in mongolia, mexico, arctic alaska, and the united kingdom	Irvine, R.D.G.; Bodenhorn, B.; Lee, E.; Amarbayasgalan, D.	Current Anthropology	2019	10.1086/706606	4	Taking as our focus ethnographic work with children in several different ethnographic settings (Bar-row, Alaska; Oaxaca, Mexico; Tuv aimag and Uvurkhangai aimag, Mongolia; and East Anglia, United Kingdom), we explore how the children come to articulate environmental knowledge as a process of "figuring out" and the extent to which the children engage with the changing climate as a matter of concern.
6	Characterizing the spatiotemporal distribution of meteorological drought as a response to climate variability: The case of rift valley lakes basin of Ethiopia	Tesfamariam, B.G.; Gessesse, B.; Melgani, F.	Weather and Climate Extremes	2019	10.1016/j.wace.2019.100237	4	The aim of this study was to evaluate climate variability and characterize the spatiotemporal distribution of meteorological droughts using a merged satellite-gauge rainfall across the major agroecological zones (AEZs) of the rift valley lakes basin.
6	Assessment of Socio-Economic and Climate Change Impacts on Water Resources in Four European Lagoon Catchments	Stefanova, A.; Hesse, C.; Krysanova, V.; Volk, M.	Environmental Management	2019	10.1007/s00267-019-01188-1	4	This study demonstrates the importance of considering potential land use and management changes in climate impact research.
6	Community-Based Social Marketing—Creating Lasting, Sustainable, Environmental Change: Case Study of a Household Stormwater Management Program in the Region of Waterloo, Ontario	Smith, L.K.M.; Lynes, J.K.; Wolfe, S.E.	Social Marketing Quarterly	2019	10.1177/1524500419883288	4	Using community-based social marketing (CBSM) as a framework, we investigated how to more effectively encourage stormwater management at the household level. In collaboration with the Canadian non-profit organization, Reep Green Solutions (Region of Waterloo, Ontario), we focused on an existing program, the RAIN Home Visit (RHV), which was designed to increase engagement in pro-environmental stormwater management behaviors.
6	Exploring methodological approaches to assess climate change vulnerability and adaptation: reflections from using life history approaches	Singh, C.; Tebboth, M.; Spear, D.; Ansah, P.; Mensah, A.	Regional Environmental Change	2019	10.1007/s10113-019-01562-z	4	We argue that such methodological conservatism tends to neglect the dynamic and differentiated nature of livelihood decisions. Since different methodologies privilege different portrayals of risk and response, we highlight how plural methodological approaches can capture a broader range of perspectives and problematisations. In this paper, we draw on life history (LH) interviews across four countries (Kenya, Namibia, Ghana, and India) to offer one way of expanding current methodological approaches on vulnerability and adaptation.
6	Friend or foe? UK farmers' relationships with the weather	Osborne, R.; Evans, N.	Journal of Rural Studies	2019	10.1016/j.jrurstud.2019.10.028	3	Views are collected using a broad-based quantitative scoping survey combined with in-depth qualitative research with farmers located in the Welsh Marches border region of England and Wales, UK.
6	Does nature of livelihood regulate the urban community's vulnerability to climate change? Guwahati city, a case study from North East India	Paul, A.; Deka, J.; Gujre, N.; Rangan, L.; Mitra, S.	Journal of Environmental Management	2019	10.1016/j.jenvman.2019.109591	6	There is dearth of studies on climate change based vulnerabilities of the urban people. It has been a matter of widespread debate whether nature of livelihood has any role to play in regulating the vulnerabilities of an individual. To find an answer, in a first ever attempt, this study tested three different approaches viz.
2	How does water-reliant industry affect groundwater systems in coastal Kenya?	Ferrer, N.; Folch , A.; Lane, M.; Olago, D.; Katuva, J.; Thomson, P.; Jou, S.; Hope, R.; Custodio, E.	Science of the Total Environment	2019	10.1016/j.scitotenv.2019.133634	4	This study presents a real case study in which a combination of different hydrogeological tools together with different sources of information allow the assessment of how increased competition for water may be affecting groundwater systems by analysing the sustainability of new abstraction regimes under different real climatic condition (before, during and after La Niña 2016).
6	Heterogeneous seed access and information exposure: implications for the adoption of drought-tolerant maize varieties in Uganda	Simtowe, F.; Marenya, P.; Amondo, E.; Worku, M.; Rahut, D.B.; Erenstein, O.	Agricultural and Food Economics	2019	10.1186/s40100-019-0135-7	4	We use empirical data from Uganda to estimate the actual and potential adoption rates and the adoption determinants of DTMVs under information and seed access constraints.
6	Valuation of ecosystem services by stakeholders operating at different levels: insights from the Portuguese cultural montado landscape	do Rosário, I.T.; Rebelo, R.; Caser, U.; Vasconcelos, L.; Santos-Reis, M.	Regional Environmental Change	2019	10.1007/s10113-019-01527-2	4	We used a series of participatory workshops at local and regional levels to assess the ecosystem services most valued by these stakeholders. We also evaluated their awareness of the threats to montado and their vision for its future provision of ecosystem services.
10	Adaptation "from below" to changes in species distribution, habitat and climate in agro-ecosystems in the Terai Plains of Nepal	Thorn, J.P.R.	Ambio	2019	10.1007/s13280-019-01202-0	3	Mixed method fieldwork compared observed changes in plant species distribution across a climatic gradient to farmers' perceptions in biodiversity and climate change in rice-cultivated farms.

6	Integrating Life Cycle Assessment and Agent-Based Modeling: A Dynamic Modeling Framework for Sustainable Agricultural Systems	Lan, K.; Yao, Y.	Journal of Cleaner Production	2019	10.1016/j.jclepro.2019.117853	4	This study addresses the challenge by developing a dynamic system modeling framework integrating Life Cycle Assessment (LCA), Agent-Based Modeling (ABM), and Techno-Economic Analysis (TEA).
2	High-resolution regional climate modeling and projection over western Canada using a weather research forecasting model with a pseudo-global warming approach	Li, Y.; Li, Z.; Zhang, Z.; Chen, L.; Kurkute, S.; Scaff, L.; Pan, X.	Hydrology and Earth System Sciences	2019	10.5194/hess-23-4635-2019	4	To assess these hydroclimatic risks under high-end emission scenario RCP8.5, this study used the Weather Research Forecasting (WRF) model at a convection-permitting (CP) 4 km resolution to dynamically downscale the mean projection of a 19-member CMIP5 ensemble by the end of the 21st century.
2	Muddying the Picture? Forecasting Particulate Sources and Dispersal Patterns in Managed Catchments	Richardson, J.C.; Hodgson, D.M.; Kay, P.; Aston, B.J.; Walker, A.C.	Frontiers in Earth Science	2019	10.3389/feart.2019.00277	4	This paper highlights single output erosion risk maps are not effective to inform catchment management.
6	Climate risk perceptions and adaptation decision-making at Nordic farm scale–a typology of risk responses	Käyhkö, J.	International Journal of Agricultural Sustainability	2019	10.1080/14735903.2019.1689062	3	This study consists of interviews with farmers and agricultural extension officers, who work with farmers and other agricultural actors to aid decision-making at the farm scale.
6	Cultivating Engagements: Ethnic Minority Migrants, Agriculture, and Environment in the Murray-Darling Basin, Australia	Head, L.; Klocker, N.; Dun, O.; Aguirre-Bielschowsky, I.	Annals of the American Association of Geographers	2019	10.1080/24694452.2019.1587286	4	Emergent research examines how environmental engagements change in the encounters of migration from Majority to Minority Worlds, providing new ideas and practices for sustainable futures. We contribute to these debates with a study in the Sunraysia region of Australia's Murray-Darling Basin, an area facing significant climate change impacts. We examine environmental engagements of ethnic minority migrants (Burundian, Hazara, Tongan, Vietnamese, and Italian) alongside Anglo-Australian residents.
2	Availability and sectoral demand for water in Tamil Nadu	Ramesh, M.; Thangamayan, S.; Sugumar, S.N.; Ramakrishnan, S.	Indian Journal of Public Health Research and Development	2019	10.5958/0976-5506.2019.03546.0	4	Study about the demand of water. The perennial rivers are becoming dry and ground water table is depleting in most of the areas. Country is facing floods and drought in the same year in many states.
6	On-farm performance and farmers' perceptions of droughttego-climate-smart maize hybrids in Kenya	Obunyali, C.O.; Karanja, J.; Oikeh, S.O.; Omanya, G.O.; Mugo, S.; Beyene, Y.; Oniang'o, R.K.	Agronomy Journal	2019	10.2134/agronj2019.08.0600	4	The purpose of this paper was to use on-farm demonstration studies and farmer field days to demonstrate new drought mitigation technology and provide information on how small farmers can reduce yield losses.
10	Conservation agriculture and maize production risk: The case of Mozambique smallholders	Kidane, S.M.; Lambert, D.M.; Eash, N.S.; Roberts, R.K.; Thierfelder, C.	Agronomy Journal	2019	10.2134/agronj2018.05.0331	4	In 17 target communities of central Mozambique from 2008–2011, we evaluated the performance of conservation agriculture practices (CAPs) to assess the risk perceptions of smallholder farmers regarding these technologies.
10	Ecosystem services and importance of common tree species in coffee-agroforestry systems: Local knowledge of small-scale farmers at Mt. Kilimanjaro, Tanzania	Wagner, S.; Rigal, C.; Liebig, T.; Mremi, R.; Hemp, A.; Jones, M.; Price, E.; Preziosi, R.	Forests	2019	10.3390/f10110963	4	Our objective is to explore ecosystem services (ESs) provided by different shade tree species as perceived by farmers and possible factors (elevation, gender, and membership in local farmers groups) influencing these perceptions.
2	Socioeconomic determinants of nutritional status among 'Baiga' tribal children in Balaghat district of Madhya Pradesh: A qualitative study	Shirisha, P.	PLoS ONE	2019	10.1371/journal.pone.0225119	4	We have employed qualitative design for the study, as we wanted to understand the contextual factors for Baiga tribal children's inferior nutrition status.
12	Eighth annual conference of in VIVO planetary health: From challenges to opportunities	Prescott, S.L.; Hancock, T.; Bland, J.; van den Bosch, M.; Jansson, J.K.; Johnson, C.C.; Kondo, M.; Katz D.; Kort, R.; Kozyrskyj, A.; Logan, A.C.; Lowry, C.A.; Nanan, R.; Poland, B.; Robinson, J.; Schroeck, N.; Sinkkonen, A.; Springmann, M.; Wright, R.O.; Wegienka, G.; VIVO Planetary Health of the Worldwide Universities Network (WUN);	International Journal of Environmental Research and Public Health	2019	10.3390/ijerph16214302	4	Our goal is to transform personal and planetary health through awareness, attitudes, and actions, and a deeper understanding of how all systems are interconnected and interdependent. Here, we present the abstracts and proceedings of our 8th annual conference, held in Detroit, Michigan in May 2019, themed "From Challenges, to Opportunities".
6	Shifting perceptions of rapid temperature changes' effects on marine fisheries, 1945–2017	McClenachan, L.; Grabowski, J.H.; Marra, M.; McKeon, C.S.; Neal, B.P.; Record, N.R.; Scyphers, S.B.	Fish and Fisheries	2019	10.1111/faf.12400	8	Here, we document the effects of rapidly changing water temperatures along the United States' east coast using observations from fisheries newspapers during a warming phase (1945–1951) and subsequent cooling phase (1952–1960) of the Atlantic Multidecadal Oscillation, which we compared to similar recent observations of warming waters (1998–2017).
11	Derivation of a climate change adaptation index and assessing determinants and barriers to adaptation among farming households in Nepal	Khanal, U.; Wilson, C.	Environmental Science and Policy	2019	10.1016/j.envsci.2019.08.006	4	This paper attempts to fulfill the methodological gap in measuring adoption of climate change adaptation practices among smallholder farmers in less developed countries.
6	Impact of climate smart agriculture (CSA) through sustainable irrigation management on Resource use efficiency: A sustainable production alternative for cotton	Imran, M.A.; Ali, A.; Ashfaq, M.; Hassan, S.; Culas, R.; Ma, C.	Land Use Policy	2019	10.1016/j.landusepol.2019.104113	4	Article about Climate-smart agriculture (CSA). CSA improves agricultural productivity and enhance farm income on a sustainable basis, enhance water and nutrients use efficiency, resilient to climatic stresses, and lowering the emissions of Greenhouse Gas (GHG) to a minimum level.
2	Durum wheat yield uncertainty under different tillage management practices and climatic conditions	Baiamonte, G.; Novara, A.; Gristina, L.; D'Asaro, F.	Soil and Tillage Research	2019	10.1016/j.still.2019.104346	4	The aim of this research is (i) to define durum wheat suitability under NT soil management in terms of yield success probability and (ii) to determine the suitable area for NT wheat cultivation within three climatic periods (the past, present, and future).
6	Mobilising hydrosocial power: Climate perception, migration and the small scale geography of water in Cambodia	Parsons, L.; Chann, S.	Political Geography	2019	10.1016/j.polgeo.2019.102055	4	Drawing on data gleaned from a multi-sited study of rural and migrant livelihoods in Cambodia, this paper highlights how the small scale, power-laden geography of water resources and irrigation shapes migration in response to the changing climate.
6	Perceptions of Resilience in Fishery-Dependent Bahamian Communities Following a Category 4 Hurricane	Valdez, R.X.; Peterson, N.; Chen, A.; Steward, M.; Hannameyer, K.; Seebaluck, H.; Hulthén, K.; Langerhans, R.B.	Fisheries	2019	10.1002/fsh.10310	4	We began evaluating this possibility with a qualitative study in the Lowe Sound and Red Bays communities in The Bahamas immediately after the impact of a category 4 hurricane. We interviewed 68 households, asking about the relationships between the storm's impacts and fisheries resources.

6	Ensuring climate services serve society: examining tribes' collaborations with climate scientists using a capability approach	Kalafatis, S.E.; Whyte, K.P.; Libarkin, J.C.; Caldwell, C.	Climatic Change	2019	10.1007/s10584-019-02429-2	4	This paper compares 30 Tribe-affiliated and 36 CSO-affiliated individuals' perceptions about potential harms and benefits associated with their collaborations with one another.
6	Wheat yield response to input and socioeconomic factors under changing climate: Evidence from rainfed environments of Pakistan	Mahmood, N.; Arshad, M.; Kächele, H.; Ma, H.; Ullah, A.; Müller, K.	Science of the Total Environment	2019	10.1016/j.scitotenv.2019.06.266	3	This study aims to quantify the impacts of climate variability on mean yield levels and yield variability of wheat crop in the rainfed zone of Pakistan.
6	In the blind-spot of governance – Stakeholder perceptions on seagrasses to guide the management of an important ecosystem services provider	Ruiz-Frau, A.; Krause, T.; Marbà, N.	Science of the Total Environment	2019	10.1016/j.scitotenv.2019.06.324	4	Here, we show how the analysis of stakeholders' perceptions on seagrass ES, their drivers of change, links to wellbeing and governance structures can provide a path towards a more sustainable management.
6	Sustainability Dimensions of a North American Lentil System in a Changing World	Warne, T.; Ahmed, S.; Byker Shanks, C.; Miller, P.	Frontiers in Sustainable Food Systems	2019	10.3389/fsufs.2019.00088	3	The purpose of this study is to evaluate producer and consumer perceptions of the sustainability profile of the lentil system in Montana (USA), and the surrounding region that includes Idaho (USA), North Dakota (USA), Washington (USA), and Canada, in the context of global change.
6	It is Always Dry Here: Examining Perceptions about Drought and Climate Change in the Southern High Plains	Colston, N.M.; Vadjunec, J.M.; Fagin, T.	Environmental Communication	2019	10.1080/17524032.2018.1536071	3	Household surveys (n = 120) were conducted in Cimarron County, Oklahoma and Union County, New Mexico using a stratified random sampling method to select farmers, ranchers, and town residents.
6	Dairy production under climatic risks: Perception, perceived impacts and adaptations in Punjab, Pakistan	Abbas, Q.; Han, J.; Adeel, A.; Ullah, R.	International Journal of Environmental Research and Public Health	2019	10.3390/ijerph16204036	3	The current paper determines the influence of climate change on the dairy sector in Pakistan.
6	Perceptions of fairness in common-pool resource access: farmer responses to new agricultural water use restrictions in Idaho	Running, K.; Burnham, M.; Du Bray, M.V.	Environmental Sociology	2019	10.1080/23251042.2019.1643548	3	This study examines farmers' perceptions of fairness regarding an agricultural water use policy change in Idaho: the 2015 settlement agreement, a compromise between ground- and surface water farmers in Idaho's Eastern Snake Plain Aquifer (ESPA) that requires reductions in groundwater withdrawals of about 13% for all groundwater farmers.
2	Revisiting agroforestry for building climate resilient communities: A case of package-based integrated agroforestry practices in Nepal	Aryal, K.; Thapa, P.S.; Lamichhane, D.	Emerging Science Journal	2019	10.28991/esj-2019-01193	4	This paper reflects on the process and outcomes of the agroforestry practices, implemented by the government in seven super zones of Nepal.
6	Cod and climate: a systems approach for sustainable fisheries management of Atlantic cod (Gadus morhua) in coastal Danish waters	Dinesen, G.E.; Neuenfeldt, S.; Kokkalis, A.; Lehmann, A.; Egekvist, J.; Kristensen, K.; Munk, P.; Hüssy, K.; Støttrup, J.G.	Journal of Coastal Conservation	2019	10.1007/s11852-019-00711-0	4	This study applied the Systems Approach Framework (SAF) to address the issue of declining Atlantic cod fishery in coastal areas. Interviews of 58 fishers from 26 harbours and meetings with national fisheries organisations and managers revealed the perception of an offshore movement of coastal cod.
6	An intra-household analysis of farmers' perceptions of and adaptation to climate change impacts: empirical evidence from drought prone zones of Bangladesh	Al-Amin, A.K.M.A.; Akhter, T.; Islam, A.H.M.S.; Jahan, H.; Hossain, M.J.; Prodhan, M.M.H.; Mainuddin, M.; Kirby, M.	Climatic Change	2019	10.1007/s10584-019-02511-9	4	This study identified the intra-household perceptions and their determinants, the major strategies adopted by the farmers to adapt to climate change, and the factors that affect their adaptation decision and choice of strategies including the role of intra-household decision making in a drought prone environment of Bangladesh.
2	Intelligent computational techniques for crops yield prediction and fertilizer management over big data environment	Alex, S.A.; Kanavalli, A.	International Journal of Innovative Technology and Exploring Engineering	2019	10.35940/ijitee.L2622.1081219	4	The main aim of this research is to design the effective crop yield production and health risk analysis model by big data analytics model.
6	Factors influencing social perception of residential solar photovoltaic systems in Saudi Arabia	Alrashoud, K.; Tokimatsu, K.	Sustainability (Switzerland)	2019	10.3390/su11195259	4	The present study aims to examine factors that may potentially motivate or impede individuals from purchasing RSPSs based on the diffusion of innovations theory.
2	Retrospective and prospective look at aflatoxin research and development from a practical standpoint	Benkerroum, N.	International Journal of Environmental Research and Public Health	2019	10.3390/ijerph16193633	4	This review presents the main historical discoveries leading to our present knowledge on aflatoxins and the challenges that should be addressed presently and in the future at various levels to ensure higher health protection for everybody. In short, it aims to elucidate where we come from and where we should go in terms of aflatoxin research/development.
6	Divisional disparities on climate change adaptation and mitigation in Punjab, Pakistan: local perceptions, vulnerabilities, and policy implications	Hussain, M.; Butt, A.R.; Uzma, F.; Ahmed, R.; Rehman, A.; Ali, M.U.; Ullah, H.; Yousaf, B.	Environmental Science and Pollution Research	2019	10.1007/s11356-019-06262-z	3	This research focuses on the Punjab province of Pakistan and evaluates the impacts and consequences of climate change on general public at local and divisional level.
11	Community perceptions link environmental decline to reduced support for tourism development in small island states: A case study in the Turks and Caicos Islands	Robinson, D.; Newman, S.P.; Stead, S.M.	Marine Policy	2019	10.1016/j.marpol.2019.103671	3	The relationship between residents' perceived impacts of tourism, marine resource health, and support for future development was investigated through face-to-face semi-structured interviews with 57 stakeholders, including heads of households, fishers and those working in the tourism sector, on the Island of Grand Turk (Turks and Caicos Islands).
6	Prioritizing Land and Water Interventions for Climate-Smart Agriculture	Alam, M.F.; Sikka, A.K.	Irrigation and Drainage	2019	10.1002/ird.2366	4	To aid in this decision-making process of prioritizing land and water interventions, a simple and robust spreadsheet tool based on a water balance is developed.
2	A spatial approach to climate-resilient infrastructure in coastal social-ecological systems: The case of dumbeong in Goseong County, South Korea	Kim, G.; Kang, W.; Lee, D.; Vaswani, R.T.; Chon, J.	Environment International	2019	10.1016/j.envint.2019.105032	4	We analyzed the spatial relationship of dumbeongs with coastal landscape attributes and droughts in Goseong County in South Korea. We used generalized linear models (GLMs) to examine the effects of land cover and recent (2001–2010) standardized precipitation index (SPI) on the abundance of dumbeongs.
2	Economic impact of climate change on agriculture using Ricardian approach: A case of northwest Vietnam	Huong, N.T.L.; Bo, Y.S.; Fahad, S.	Journal of the Saudi Society of Agricultural Sciences	2019	10.1016/j.jssas.2018.02.006	4	This study uses the Ricardian approach to explore the implications of climate change on agriculture in the Northwestern area of Vietnam by taking farmer adaptations into account.

6	Adoption of agroforestry practices and climate change mitigation strategies in North West province of South Africa	Oduniyi, O.S.; Tekana, S.S.	International Journal of Climate Change Strategies and Management	2019	10.1108/IJCCSM-02-2019-0009	2	Maize farmers. The list of small and emerging maize farmers in the districts was obtained from the Department of Agriculture, Forestry and Fisheries to determine the population of the small and emerging maize farmers in the study area.
6	Historical perspective of climate change in sustainable livelihoods of coastal areas of the Red River Delta, Nam Dinh, Vietnam	Tran, T.K.V.; Elahi, E.; Zhang, L.; Magsi, H.; Pham, Q.T.; Hoang, T.M.	International Journal of Climate Change Strategies and Management	2019	10.1108/IJCCSM-02-2018-0016	3	Location: Nam Dinh province, Vietnam and does not mention smallholders.
6	Farmers' typologies regarding environmental values and climate change: Evidence from southern Brazil	Foguesatto, C.R.; Borges, J.A.R.; Machado, J.A.D.	Journal of Cleaner Production	2019	10.1016/j.jclepro.2019.05.275	3	This study was conducted in nine counties of the northwest region of the Rio Grande do Sul state, located in the extreme south of Brazil. In the 2016/17 harvest, this state produced 16.4% (approximately 19 million tons) of the total Brazilian soybean production, being the third largest soybean producer.
6	Citizens' images of a sustainable energy transition	Vainio, A.; Varho, V.; Tapio, P.; Pulkka, A.; Paloniemi, R.	Energy	2019	10.1016/j.energy.2019.06.134	4	We explored citizens' images of the future energy forms and energy system in Finland, and the drivers of a sustainable energy transition.
10	Understanding gender dimensions of climate-smart agriculture adoption in disaster-prone smallholder farming communities in Malawi and Zambia	Khoza, S.; Van Niekerk, D.; Nemakonde, L.D.	Disaster Prevention and Management: An International Journal	2019	10.1108/DPM-10-2018-0347	4	Through the application of traditional and contemporary feminist theories in gender mainstreaming, the purpose of this paper is to contribute to emergent debate on gender dimensions in climate-smart agriculture (CSA) adoption by smallholder farmers in disaster-prone regions.
6	The role of media between expert and lay knowledge: A study of Iberian media coverage on climate change	Areia, N.P.; Intrigliolo, D.; Tavares, A.; Mendes, J.M.; Sequeira, M.D.	Science of the Total Environment	2019	10.1016/j.scitotenv.2019.05.191	4	This study aims to analyse Iberian media coverage about climate change to further discuss its influence on the public's engagement with the subject.
6	Science-policy interfaces for sustainable climate-smart agriculture uptake: lessons learnt from national science-policy dialogue platforms in West Africa	Zougmoré, R.B.; Partey, S.T.; Totin, E.; Ouédraogo, M.; Thornton, P.; Karbo, N.; Sogoba, B.; Dieye, B.; Campbell, B.M.	International Journal of Agricultural Sustainability	2019	10.1080/14735903.2019.1670934	4	Based on the platforms' operations and achievements, we used semi-structured questionnaire interviews and reviewed technical reports produced by the platforms to analyse how their modes of operation and achievements improve understanding of the science-policy interfaces between agricultural and climate change decision making.
6	Pacific salmon in the rapidly changing arctic: Exploring local knowledge and emerging fisheries in Utqia?vik and Nuiqsut, Alaska	Carothers, C.; Sformo, T.L.; Cotton, S.; George, J.C.; Westley, P.A.H.	Arctic	2019	10.14430/arctic68876	4	While habitat loss and destruction has severed connections between people and salmon in many locales, salmon fisheries in the high Arctic are just beginning to develop. To explore these emergent connections, we gathered local knowledge about Pacific salmon and emerging subsistence salmon fisheries in the Beaufort Sea region through ethnographic research in Utqiaġvik (formerly Barrow) and Nuiqsut, Alaska. Between 2010 and 2013, we interviewed 41 active fishermen and Elders who generally agreed that harvests of Pacific salmon species have been increasing in recent years, beginning in the 1990s and early 2000s. About 46% of active fishermen and Elders who discussed salmon abundance perceived an increasing trend over time.
2	Environmental change and sustainability of indigenous languages in northern Alaska	Reo, N.J.; Topkok, S.M.; Kanayurak, N.; Stanford, J.N.; Peterson, D.A.; Whaley, L.J.	Arctic	2019	10.14430/arctic68655	4	In this collaborative, community-centered project, we spoke with Iñupiaq and Yupik language speakers to learn how rapid environmental change affects heritage language discourse practices and how generational gaps in levels of heritage language fluency affect safety and efficacy of customary and traditional land use activities.
6	Is agricultural emissions mitigation on the menu for tea drinkers?	Boehm, R.; Kitchel, H.; Ahmed, S.; Hall, A.; Orians, C.M.; Stepp, J.R.; Robbat, A.; Jr.; Griffin, T.S.; Cash, S.B.	Sustainability (Switzerland)	2019	10.3390/su11184883	3	The objective of this study was to estimate WTP for agricultural GHG mitigation and examine variability in WTP across consumer characteristics, climate change knowledge and risk perception in the Midwest and Northeastern U.S.
6	Water resource utilization and livelihood adaptations under the background of climate change: A case study of rural households in the Koshi River Basin	Wan, J.; Song, X.; Su, Y.; Peng, L.; Khatiwada, S.P.; Zhou, Y.; Deng, W.	Sustainability (Switzerland)	2019	10.3390/su11185064	4	This article explores the impacts of climate change-related floods and droughts, as well as the water resource utilization, disaster resilience, and livelihood improvement ability of farmers and the influencing factors. This article adopted participatory rural appraisal to obtain survey data from farmers at three altitudes.
6	Knowledge, attitude and practice in water resources management among smallholder irrigators in the Tsavo sub-catchment, Kenya	Oremo, F.; Mulwa, R.; Oguge, N.	Resources	2019	10.3390/resources8030130	4	We analysed farmers' engagement in water resources management and explored how this can inform water resource planning.
6	Uptake of climate-smart agricultural technologies and practices: Actual and potential adoption rates in the climate-smart village site of Mali	Ouédraogo, M.; Houessionon, P.; Zougmoré, R.B.; Partey, S.T.	Sustainability (Switzerland)	2019	10.3390/su11174710	4	This paper used the Average Treatment Effect framework to derive consistent parametric estimators of the potential adoption rates of eight CSA technologies and practices in the Climate-Smart Village (CSV) site of Mali.
2	Marine recreational fishing and the implications of climate change	Townhill, B.L.; Radford, Z.; Pecl, G.; van Putten, I.; Pinnegar, J.K.; Hyder, K.	Fish and Fisheries	2019	10.1111/faf.12392	4	Drawing on examples from the UK and Australia, we synthesize existing knowledge to develop a conceptual model of climate-driven factors that could impact marine recreational fisheries, in terms of operations, participation and motivation.
6	Assessing farmers' perspectives on climate change for effective farm-level adaptation measures in Khyber Pakhtunkhwa, Pakistan	Ullah, W.; Nafees, M.; Khurshid, M.; Nihei, T.	Environmental Monitoring and Assessment	2019	10.1007/s10661-019-7651-5	6	Location: Charsadda district (lowlands) of Khyber Pakhtunkhwa. Khyber Pakhtunkhwa (KP) is in the north-west of Pakistan and is the third largest provincial economy in the country.
6	Vulnerability, well-being, and livelihood adaptation under changing environmental conditions: a case from mountainous region of Pakistan	Shahzad L.; Tahir A.; Sharif F.; Khan W.U.D.; Farooq M.A.; Abbas A.; Saqib Z.A.;	Environmental Science and Pollution Research	2019	10.1007/s11356-019-05880-x	4	The objective of the current study is to assess the livelihood practices and adaptive capacity of a mountainous region of Pakistan, the Balakot, where people are highly vulnerable to climatic changes.
6	Worldwide research trends on sustainable land use in agriculture	Aznar-Sánchez J.A.; Piquer-Rodríguez, M.; Velasco-Muñoz, J.F.; Manzano-Agugliaro, F.	Land Use Policy	2019	10.1016/j.landusepol.2019.104069	8	The objective of this study is to analyse the evolution of this line of research worldwide to date. A bibliometric analysis of the existing articles from the period 1988–2017 was conducted.
11	The effects of trainings in soil and water conservation on farming practices, livelihoods, and land-use intensity in the Ethiopian highlands	Chesterman, N.S.; Entwistle, J.; Chambers, M.C.; Liu, H.-C.; Agrawal, A.; Brown, D.G.	Land Use Policy	2019	10.1016/j.landusepol.2019.104051	4	Our study uses multiple methods to estimate the socio-ecological effects of a soil and water conservation training program for farmers implemented by ADHENO Integrated Rural Development Association, an Ethiopian non-governmental organization.

6	Achieving water security in rural Indian Himalayas: A participatory account of challenges and potential solutions	Sem, S.M.; Kansal, A.	Journal of Environmental Management	2019	10.1016/j.jenvman.2019.05.132	4	Five PASTs, each constructed by a different group of stakeholders, namely the state government, the local government, researchers, development agencies, and the local community, were analysed to obtain a holistic and multi-sectoral understanding of water security in the region, and the analysis was supplemented with field data.
6	Livestock insurance as a mechanism for household resilience of livestock herders to climate change: Evidence from Iran	Biglari, T.; Maleksaeidi, H.; Eskandari, F.; Jalali, M.	Land Use Policy	2019	10.1016/j.landusepol.2019.104043	4	We advanced knowledge in this area by: a) estimating household resilience to climate change and identifying the typology of livestock herders in terms of resilience; b) assessing the influence of livestock insurance on the household resilience of livestock herders
11	Barriers and opportunities for social-ecological adaptation to climate change in coastal British Columbia	Whitney, C.K.; Ban, N.C.	Ocean and Coastal Management	2019	10.1016/j.ocecoaman.2019.05.010	3	Using a web-based survey and semi-structured interviews, we explored the perceptions of practitioners (coastal managers and planners) in British Columbia, Canada relative to climate change risks, adaptation actions for social and ecological systems, and barriers for adaptation within the region.
6	Livelihoods, gender and climate change in the Eastern himalayas	Bhadwal, S.; Sharma, G.; Gorti, G.; Sem, S.M.	Environmental Development	2019	10.1016/j.envdev.2019.04.008	4	The paper seeks to draw insights from the various field studies conducted in these locations to understand the gender vulnerabilities that manifest through a combination of complex and interlinked factors. It seeks to understand the existing social practices typically associated with these gender groups and how changes in the climate are and potentially influence vulnerability.
6	Frozen narratives: How media present security in the Arctic	Padrtova, B.	Polar Science	2019	10.1016/j.polar.2019.05.006	4	The current academic discourse on the concept of regional security is characterized by several theoretical approaches and schools. For the purpose of this article, the modified securitization theory (Copenhagen School) is applied as it expands the security agenda beyond the classical military sector to politics, environment, economy and society.
2	Virtual water scarcity risk to global trade under climate change	Zhao, H.; Qu , S.; Guo, S.; Zhao, H.; Liang, S.; Xu, M.	Journal of Cleaner Production	2019	10.1016/j.jclepro.2019.05.114	4	Key nation-sectors with the greatest virtual water scarcity risk (VWSR)exports are identified under two climate change scenarios, including the Agriculture sectors in Syria, Pakistan, Kazakhstan, India, Uzbekistan, Iran, and China. Improving water efficiency in these sectors is essential for increasing the resilience of the global economy against climate change-induced water scarcity.
2	A critical review of organic manure biorefinery models toward sustainable circular bioeconomy: Technological challenges, advancements, innovations, and future perspectives	Awasthi, M.K.; Sarsaiya, S.; Wainaina, S.; Rajendran, K.; Kumar, S.; Quan, W.; Duan, Y.; Awasthi, S.K.; Chen, H.; Pandey, A.; Zhang, Z.; Jain, A.; Taherzadeh, M.J.	Renewable and Sustainable Energy Reviews	2019	10.1016/j.rser.2019.05.017	4	Article about circular bioeconomy.
6	Perceptions of climate shocks and gender vulnerabilities in the Upper Ganga Basin	Khandekar, N.; Gorti, G.; Bhadwal, S.; Rijhwani, V.	Environmental Development	2019	10.1016/j.envdev.2019.02.001	4	This study, using empirical evidence from sites in Uttarakhand, establishes an understanding on how place-based vulnerabilities influence the livelihoods – analyzed through the sustainable livelihoods frameworks. The research also highlights the gender differentiated impacts that arise due to existing social norms and practices evident in the study sites.
6	Impacts of climate change on tomato, a notorious pest and its natural enemy: Small scale agriculture at higher risk	Litskas, V.D.; Migeon, A.; Navajas, M.; Tixier, M.-S.; Stavrinides, M.C.	Environmental Research Letters	2019	10.1088/1748-9326/ab3313	4	Here, we modelled the suitability of areas equipped with irrigation facilities (AEI) in 2050 for tomato, the two-spotted spider mite, Tetranychus urticae, a mite pest of tomato among more than 200 crops, and its key predator Phytoseiulus persimilis. We evaluated the suitability of AEI for tomato production under a 1.6 °C warming by 2050, within the targets of the Paris agreement.
6	Perceptions of Malaysian farmers regarding their knowledge in agricultural risk management	Ali, M.; Man, N.; Muharam, F.M.	Journal of Animal and Plant Sciences	2019		4	Therefore, the study was planned to assess perceptions of farming community towards knowledge in agricultural risk management.
6	Putting uncertainty under the cultural lens of Traditional Owners from the Great Barrier Reef Catchments	Lyons, I.; Hill, R.; Deshong, S.; Mooney, G.; Turpin, G.	Regional Environmental Change	2019	10.1007/s10113-019-01468-w	4	Our results illustrate that indigenous groups primarily perceive uncertainties related to volition of actors and institutions. When they are involved in climate adaptation planning in ways that mobilise their cultural institutions and knowledge, they can safely manage these uncertainties through their agency to determine and control key risks. We demonstrate that climate justice approaches can be strengthened for indigenous peoples by applying a linked vulnerability-resilience analytical framework.
6	Assessing the impacts of changing climate on forest ecosystem services and livelihood of balakot mountainous communities	Shahzad, L.; Tahir, A.; Sharif, F.; Ul Haq, I.; Mukhtar, H.	Pakistan Journal of Botany	2019	10.30848/PJB2019-4(1)	4	The current study has estimated vulnerability of mountain forests and the provision of forest services to Balakot local community in context of climate change.
6	Performance of pasture-based dairy systems subject to economic, climatic and regulatory uncertainty	Beukes, P.C.; Romera, A.J.; Neal, M.; Mashlan, K.	Agricultural Systems	2019	10.1016/j.agsy.2019.05.002	4	Viable pasture-based dairy businesses need to cope with increasing variability in milk price, extremes in weather, and an uncertain regulatory environment that may impose disruptive mitigations. This modelling study was designed to assess system performance in response to price and climate variability of three pasture-only systems, 12-month, 6-month and 3-month, each with a range of stocking rates.
6	Embracing uncertainty: A discursive approach to understanding pathways for climate adaptation in Senegal	Ayeb-Karlsson, S.; Fox, G.; Kniveton, D.	Regional Environmental Change	2019	10.1007/s10113-019-01495-7	4	Here we follow a definition of 'pathways to adaptation' as representing a set of proactive changes in the present that move people from a climatically unsafe place, to positions of safety (self-defined as representing freedom from harm or adverse effect). This article applies an inter-discursive analytical approach where (un)certainty and (un)safety are used to deepen the understanding around the positions of people in Senegal, and their livelihoods, with respect to climate hazards. We examine the discursive socio-cultural values active in the climate adaptive space.
6	Human perceptions of, and adaptations to, shifting runoff cycles: A case-study of the Yellowstone River (Montana, USA)	Lamborn, C.C.; Smith, J.W.	Fisheries Research	2019	10.1016/j.fishres.2019.04.005	3	We conducted semi-structured, in-depth interviews with outfitters, guides, government researchers, and state fisheries biologists/managers working within the Yellowstone River watershed.
6	Sustainable development and energy education in Nigeria	Wojuola, R.N.; Alant, B.P.	Renewable Energy	2019	10.1016/j.renene.2019.03.010	4	This paper is based on a previous study that explored the beliefs, perceptions and attitudes of the Nigerian public to renewable energy technologies so as to derive implications for science and technology policy and education in the country.
6	Climate change perceptions and responsive strategies in Benin: the case of maize farmers	Soglo, Y.Y.; Nonvide, G.M.A.	Climatic Change	2019	10.1007/s10584-019-02452-3	3	This study provides answers to how farmers perceive climate change and what drives their adaptation decisions. To do this, data were collected from a random sample of 200 maize farmers in the municipality of Zè, Benin.
6	Assessing the adaptive capacity of farmers under the impact of saltwater intrusion in the Vietnamese Mekong Delta	Hoan, N.X.; Nguyen Khoi, D.; Trung, L.D.	Journal of Environmental Planning and Management	2019	10.1080/09640568.2019.1631147	4	The objective of this study was to assess farmers' adaptive capacities towards saline intrusion in the Tra Vinh province in order to provide appropriate adaptation options, using the MOTA (Motivation-Ability) approach.
6	Farmer adoptability for livelihood transformations in the Mekong Delta: a case in Ben Tre province	Nguyen, H.Q.; Korbee, D.; Ho, H.L.; Weger, J.; Thi Thanh Hoa, P.; Thi Thanh Duyen, N.; Dang Manh Hong Luan, P.; Luu, T.T.; Ho Phuong Thao, D.; Thi Thu Trang, N.; Hermans, L.; Evers, J.; Wyatt, A.; Chau Nguyen, X.Q.; Long Phi, H.	Journal of Environmental Planning and Management	2019	10.1080/09640568.2019.1568768	4	In this study, we applied a bottom-up approach to understand the motivations and abilities of local farmers to adopt alternative livelihood models.
2	Computing the economic value of climate information for water stress management exemplified by crop production in Austria	Mitter, H.; Schmid, E.	Agricultural Water Management	2019	10.1016/j.agwat.2019.04.005	4	Hence, we have developed an integrated modeling framework consisting of a statistical climate model, a crop rotation model, a bio-physical process model, a portfolio optimization model, the computation of the economic value of climate information, and a spatial hot spot analysis and applied it to the context of water stress management in crop production in Austria.

2	The influence of climate variability, soil and sowing date on simulation-based crop coefficient curves and irrigation water demand	Seidel, S.J.; Barfus, K.; Gaiser, T.; Nguyen, T.H.; Lazarovitch, N.	Agricultural Water Management	2019	10.1016/j.agwat.2019.02.007	4	To improve the transferability of the Kc approach while keeping the Kc concept as a relatively simple and visual tool for irrigation scheduling, a simulation-based approach to estimate site-specific continuous Kc curves was developed.
29	Influence of livelihood assets, experienced shocks and perceived risks on smallholder coffee farming practices in Peru	Jezeer, R.E.; Verweij, P.A.; Boot, R.G.A.; Junginger, M.; Santos, M.J.	Journal of Environmental Management	2019	10.1016/j.jenvman.2019.04.101	2	Monoculture coffee growers.
6	Asian states at the Arctic Council: perceptions in Western States	Babin, J.; Lasserre, F.	Polar Geography	2019	10.1080/1088937X.2019.1578290	4	Indeed, many western media reflect concerns about the interest of Asian States for the Arctic and for the Arctic Council, and the possible loss of influence of the Arctic indigenous communities and States in the Arctic Council. Interrogations about the intentions of these new observers, India, Japan, South Korea and China (in particular), have fed concerns about their possible domination of the agenda of the Council. What is the attitude of these observers at the Arctic Council and are these concerns warranted?.
6	Climate change mitigation strategies for agriculture: an analysis of nationally determined contributions, biennial reports and biennial update reports	Hönle, S.E.; Heidecke, C.; Osterburg, B.	Climate Policy	2019	10.1080/14693062.2018.1559793	4	This paper focuses on 46 countries that contribute 90% of global agricultural emissions and asks how they are addressing the agricultural sector in their climate mitigation policies. It takes into account that conditions and circumstances in countries vary significantly but might also indicate similar patterns. The analysis is based on information provided by countries in their NDCs, as well as their Biennial Reports (BRs) or Biennial Update Reports (BURs) under the UN Framework Convention on Climate Change (UNFCCC).
6	Vulnerability of communities to climate change: application of the livelihood vulnerability index to an environmentally sensitive region of China	Zhang, Q.; Zhao, X.; Tang, H.	Climate and Development	2019	10.1080/17565529.2018.1442808	4	This study examines the livelihood vulnerability of a variety of rural households by calculating the livelihood vulnerability index (LVI) with reference to the IPCC vulnerability framework and the sustainable livelihoods framework (SLF).
6	Climate change adaptations of shrimp farmers: a case study from southwest coastal Bangladesh	Islam, M.A.; Akber, M.A.; Ahmed, M.; Rahman, M.M.; Rahman, M.R.	Climate and Development	2019	10.1080/17565529.2018.1442807	3	Does not mention the smallholders.
6	Impacts of variability and change in rainfall on gender of farmers in Anambra, Southeast Nigeria	Nnadi, O.I.; Liwenga, E.T.; Lyimo, J.G.; Madukwe, M.C.	Heliyon	2019	10.1016/j.heliyon.2019.e02085	3	Location: Anambra State. In the first stage, three LGAs in Anambra (Ogbaru, Ayamelum and Anambra East) were purposively selected due to predominance of large scale farmers in the areas. In the second stage, two town communities (Atani, Ogbakuba, Ifite-Ogwari, Anaku, Aguleri and Igbariam) were selected from each LGA.
6	Perceptions, knowledge and adaptation about climate change: A study on farmers of haor areas after a flash flood in Bangladesh	Ferdushi, K.F.; Ismail, M.T.; Kamil, A.A.	Climate	2019	10.3390/cli7070085	3	Using household data from lowland rice farmers of selected haor areas in Sylhet, the current work presents an analysis of the determinants behind the implementation of different climate change adaptation strategies by lowland rice farmers in Bangladesh.
6	Climate change and dairy in New York and Wisconsin: Risk perceptions, vulnerability, and adaptation among farmers and advisors	Lane, D.; Murdock, E.; Genskow, K.; Betz, C.R.; Chatrchyan, A.	Sustainability (Switzerland)	2019	10.3390/su11133599	3	This study investigates dairy farmer and advisor views and decisions related to climate change using data from seven farmer and advisor focus groups conducted in New York and Wisconsin.
6	Identifying mechanisms of environmental decision-making: How ideology and geographic proximity influence public support for managing agricultural runoff to curb harmful algal blooms	Guo, T.; Nisbet, E.C.; Martin, J.F.	Journal of Environmental Management	2019	10.1016/j.jenvman.2019.04.021	4	In this study, we analyzed Ohio statewide and watershed specific public opinion data collected in 2013 and 2014 to examine the effects of ideology and geographic proximity to Lake Erie on public support for regulatory policies to reduce agricultural runoff.
2	Committed vs. uncommitted meat eaters: Understanding willingness to change protein consumption	Malek, L.; Umberger, W.J.; Goddard, E.	Appetite	2019	10.1016/j.appet.2019.03.024	4	This study of Australian meat consumers identifies consumer segments with varying levels of willingness to make the following changes to their protein consumption: reduce meat consumption, follow a meat-free diet most of the time, avoid meat consumption altogether, and follow a strict plant-based diet (i.e., stop eating all animal-products).
12	Evaluating the effectiveness of hazard mapping as climate change adaptation for community planning in degrading permafrost terrain	Flynn, M.; Ford, J.D.; Labbé, J.; Schrott, L.; Tagalik, S.	Sustainability Science	2019	10.1007/s11625-018-0614-x	4	This paper presents a framework for evaluating permafrost mapping exercises designed to inform climate change adaptation actions.
6	Bespoke Adaptation in Rural Africa? An Asset-Based Approach from Southern Ethiopia	Kidane, R.; Prowse, M.; de Neergaard, A.	European Journal of Development Research	2019	10.1057/s41287-018-0161-4	4	This study examines differences across wealth groups based on principal component analysis and cluster analysis triangulated with participatory methods.
6	Influence of payment modes on farmers' contribution to climate change adaptation: understanding differences using a choice experiment in Nepal	Khanal, U.; Wilson, C.; Lee, B.L.; Hoang, V.-N.; Managi, S.	Sustainability Science	2019	10.1007/s11625-018-0601-2	4	This study examines differences in Nepalese farming households' willingness to contribute to the implementation of adaptation programs across monetary and non-monetary modes of payments. To this end, we undertake discrete choice experiments with monetary payment and labor contributions as the payment vehicles.
2	Cumulative Impact Index for the Adriatic Sea: Accounting for interactions among climate and anthropogenic pressures	Furlan, E.; Torresan, S.; Critto, A.; Lovato, T.; Solidoro, C.; Lazzari, P.; Marcomini, A.	Science of the Total Environment	2019	10.1016/j.scitotenv.2019.03.021	4	The Cumulative Impact Index (CI-Index) proposed in this paper applies advanced Multi-Criteria Decision Analysis techniques to spatially model relationships between interactive climate and anthropogenic pressures, the environmental exposure and vulnerability patterns and the potential cumulative impacts for the marine ecosystems at risk.
6	Exploring Farmers' Climate Change Perceptions and Adaptation Intentions: Empirical Evidence from Austria	Mitter, H.; Larcher, M.; Schönhart, M.; Stöttinger, M.; Schmid, E.	Environmental Management	2019	10.1007/s00267-019-01158-7	3	We aim at investigating how farmers' individual cognition on climate change and adaptation as well as socio-environmental context factors affect agricultural adaptation intention and avoidance. We build on the Model of Private Proactive Adaptation to Climate Change (MPPACC) and apply a qualitative interview approach in two Austrian farming regions. Twenty semi-structured interviews have been conducted with 29 farmers.
2	Wild edible fruits of Meghalaya, North-East India: An unexplored potential for nutritional security and economic prosperity	Hazarika, T.K.; Marak, S.	Acta Horticulturae	2019	10.17660/ACTAHORTIC.2019.1241.104	4	Although these fruits contain almost all vitamins and minerals, most of them remained underexploited due to the lack of awareness of their potential, market demand and knowledge of bio-prospecting and value addition. But of now, the genetic resources of such fruits are facing a great threat of extinction due to climate change, large-scale urbanization, changing attitude and taste of peoples and developmental projects.
2	Adaptation to climate change and variability: A case of direct seeded rice in Andhra Pradesh, India	Kakumanu, K.R.; Kotapati, G.R.; Nagothu, U.S.; Kuppanan, P.; Kallam, S.R.	Journal of Water and Climate Change	2019	10.2166/wcc.2018.141	4	In India, rice is the major cereal crop grown and is influenced due to climate change and variability, inadequate water supply, labour shortage and methane emissions from rice ecosystems. This necessitates adoption action and upscaling of key adaption strategies like direct seeded rice (DSR) using validated data from rice growing areas in India. The study used experimental data of 2010–2014 and field survey data of DSR and non-DSR farmers collected during 2014.
6	Local adaptation plan of action framework and process in the agriculture sector in Nepal	Maharjan, S.K.	International Journal of Conservation Science	2019		4	This paper analyzes the LAPA initiatives and process focusing on agriculture including assessment of local climatic contexts, vulnerabilities, adaptations and barriers. Moreover, the paper presents the adaptation cases that has enhanced the awareness and adaptive capacity at the local level.

6	Local challenges and successes associated with transitioning to sustainable food system practices for a west Australian context: Multi-sector stakeholder perceptions	Sambell, R.; Andrew, L.; Godrich, S.; Wolfgang, J.; Vandenbroeck, D.; Stubley, K.; Rose, N.; Newman, L.; Horwitz, P.; Devine, A.	International Journal of Environmental Research and Public Health	2019	10.3390/ijerph16112051	4	The objective of this study was to consider food Production, Processing, Access and Consumption domains, and for each determine the challenges and successes associated with progressing towards a sustainable food system.
6	Do farmers care about climate change? Evidence from five major grain producing areas of China	Song, C.-X.; Liu, R.-F.; Oxley, L.; Ma, H.-Y.	Journal of Integrative Agriculture	2019	10.1016/S2095-3119(19)62687-0	3	Using a logistic model, this paper empirically investigated farmers' perception of climate change and its determinants based on a field survey of 1 350 rural households across five major grain producing provinces in China.
6	Threats to Freshwater Fisheries in the United States: Perspectives and Investments of State Fisheries Administrators and Agricultural Experiment Station Directors	Carlson, A.K.; Taylor, W.W.; Kinnison, M.T.; Sullivan, S.M.P.; Weber, M.J.; Melstrom, R.T.; Venturelli, P.A.; Wuellner, M.R.; Newman, R.M.; Hartman, K.J.; Zydlewski, G.B.; DeVries, D.R.; Gray, S.M.; Infante, D.M.; Pegg, M.A.; Harrell, R.M.	Fisheries	2019	10.1002/fsh.10238	3	Our purpose was to survey fisheries administrators from state fisheries agencies and Agricultural Experiment Stations (AESs) about their perceptions of, and resource investment toward, threats to freshwater fisheries in the United States.
6	Climate change and the agricultural sector in Ireland: examining farmer awareness and willingness to adopt new advisory mitigation tools	Tzemi, D.; Breen, J.	Climate Policy	2019	10.1080/14693062.2018.1546163	3	This paper presents results from a survey of 746 Irish farmers in 2014, with a view to understanding farmers' awareness of, and attitudes to, climate change and GHG emissions.
2	Archetypes of Climate Vulnerability: a Mixed-method Approach Applied in the Peruvian Andes	Vidal Merino, M.; Sietz, D.; Jost, F.; Berger, U.	Climate and Development	2019	10.1080/17565529.2018.1442804	4	We present here a mixed-method approach to assessing archetypes or patterns of climate vulnerability that combines qualitative tools from participatory rural assessment approaches and quantitative techniques including cluster analysis. We illustrate this by looking at a case study of the Central Andes of Peru.
2	Future global pig production systems according to the Shared Socioeconomic Pathways	Lassaletta, L.; Estellés, F.; Beusen, A.H.W.; Bouwman, L.; Calvet, S.; van Grinsven, H.J.M.; Doelman, J.C.; Stehfest, E.; Uwizeye, A.; Westhoek, H.	Science of the Total Environment	2019	10.1016/j.scitotenv.2019.02.079	4	To analyze the development of the pig production sector at the scale of world regions, we developed the IMAGE-Pig model to describe changes in feed demand, feed conversion ratios (FCRs), nitrogen use efficiency (NUE) and nitrogen excretion for backyard, intermediate and intensive systems during the past few decades as a basis to explore future scenarios.
2	Risk of extreme events in delta environment: A case study of the Mahanadi delta	Ghosh, A.; Das, S.; Ghosh, T.; Hazra, S.	Science of the Total Environment	2019	10.1016/j.scitotenv.2019.01.390	3	The present research assessed the risk of climatic extreme events and their variability in the delta, with an intention of mitigation or adaptation to possible impacts in specific region. Synthetic Aperture Radar (SAR) data and daily rainfall data were used to extract flood inundation. Tropical Cyclone Risk Model (TCRM) along with surge decay function was used to estimate cyclonic wind speed and surge inundation and risk indices were computed using fuzzy logic based approach.
10	Factors influencing gendered access to climate information services for farming in Senegal	Diouf, N.S.; Ouedraogo, I.; Zougmoré, R.B.; Ouedraogo, M.; Partey, S.T.; Gumucio, T.	Gender, Technology and Development	2019	10.1080/09718524.2019.1649790	4	This study aimed to identify CIS needs and analyze the most adapted dissemination channels while also determining factors that influence smallholder access.
6	Farmers' perceptions of and adaptations to water scarcity in colombian and venezuelan páramos in the context of climate change	Leroy, D.	Mountain Research and Development	2019	10.1659/MRD-JOURNAL-D-18-00062.1	3	This study examined how members of 2 water user associations in high-elevation ecosystems in Colombia and Venezuela perceive water scarcity as well as the relationship between their perception of and adaptation to it.
6	Do farmers perceive the trends of local climate variability accurately? An analysis of farmers' perceptions and meteorological data in Myanmar	Hein, Y.; Vijitsrikamol, K.; Attavanich, W.; Janekarnkij, P.	Climate	2019	10.3390/cli7050064	3	The study was carried out in two townships of the dry zone of Myanmar; ShweBo, and KyautSe.
6	Attitudes of farmers and rural area residents toward climate change adaptation measures: Their preferences and determinants of their attitudes	Baba, K.; Tanaka, M.	Climate	2019	10.3390/cli7050071	3	In this study, data obtained from an online survey were analyzed to identify the perception gap between farmers and nonfarmers (rural area residents) toward climate change adaptation measures with conventional and new elements of the psychological mechanism. Non smallholders. Nagano prefecture has the second highest production volume of both apples and grapes in Japan.
2	Analysis of food crops farmers' choice of climate change adaptation strategies in Kwara State, Nigeria	Larbi, I.; Nmadu, J.N.; Gana, A.S.; Okhimamhe, A.	Kasetsart Journal of Social Sciences	2019	10.34044/j.kjss.2019.40.2.11	4	This study investigated the factors influencing the choice of a particular adaptation strategy by cassava and yam farmers in Kwara State, Nigeria.
6	Assessing the role of the perceived impact of climate change on national adaptation policy: The case of rice farming in Indonesia	Rondhi, M.; Khasan, A.F.; Mori, Y.; Kondo, T.	Land	2019	10.3390/land8050081	3	We used data from the Indonesian Rice Farm Household survey consisting of 87,330 farmers.
6	Assessing maize farmers' adaptation strategies to climate change and variability in ghana	Sadiq, M.A.; Kuwornu, J.K.M.; Al-Hassan, R.M.; Alhassan, S.I.	Agriculture (Switzerland)	2019	10.3390/agriculture9050090	2	Maize farmers.
6	Farmers' intention to climate change adaptation in agriculture in the Red River Delta Biosphere Reserve (Vietnam): A combination of Structural Equation Modeling (SEM) and Protection Motivation Theory (PMT)	Luu, T.A.; Nguyen, A.T.; Trinh, Q.A.; Pham, V.T.; Le, B.B.; Nguyen, D.T.; Hoang, Q.N.; Pham, H.T.T.; Nguyen, T.K.; Luu, V.N.; Hens, L.	Sustainability (Switzerland)	2019	10.3390/su11102993	4	The paper deals with a quantitative approach combined with behavior theories and surveyed data to analyze farmers' intention to climate change adaptation in agriculture.
6	Terroir in transition: Environmental change in the Wisconsin artisanal cheese and new England oyster sectors	De Master, K.T.; LaChance, J.; Bowen, S.; MacNell, L.	Sustainability (Switzerland)	2019	10.3390/su11102969	4	Even as the concept of terroir becomes more salient in diverse cultural and national contexts, climate-driven environmental change threatens to alter the ecologies that contribute to the distinctive terroir of place-based products. Yet few studies examine how producers of terroir products perceive and experience environmental change. Our comparative case study addresses this gap, as we examine ways that changing ecological conditions will influence the emergent terroir ofWisconsin artisanal cheese and New England oysters.
2	Assessment of agricultural drought considering the hydrological cycle and crop phenology in the Korean Peninsula	Lim, C.-H.; Kim, S.H.; Chun, J.A.; Kafatos, M.C.; Lee, W.-K.	Water (Switzerland)	2019	10.3390/w11051105	4	Hence, we proposed the Standardized Agricultural Drought Index (SADI), which is a new drought index specialized for agriculture and crops, and evaluated current and expected droughts in the Korean Peninsula. The SADI applies crop phenology to the hydrological cycle, which is a basic element that assesses drought.

6	How are healthy, working populations affected by increasing temperatures in the tropics? Implications for climate change adaptation policies	Masuda, Y.J.; Castro, B.; Aggraeni, I.; Wolff, N.H.; Ebi, K.; Garg, T.; Game, E.T.; Krenz, J.; Spector, J.	Global Environmental Change	2019	10.1016/j.gloenvcha.2019.03.005	4	Micro-level data from developing regions is needed to understand the extent of heat exposure, as well as current and future adaptation strategies of working, healthy, and rural populations. We fill this gap using objective environmental measurements from 3M (TM) Questemp (TM) 46 Heat Stress Monitors, as well as survey data from working, healthy, and rural communities in East Kalimantan, Indonesia. Our data contain two groups: those who work in only open areas, and those who work in both forests and open areas.
6	Socio-economic context of soil erosion: A comparative local stakeholders' case study from traditional agricultural region in the Czech Republic	Vávra, J.; Duží, B.; Lapka, M.; Cudlínová, E.; Rikoon, J.S.	Land Use Policy	2019	10.1016/j.landusepol.2019.03.005	4	The research documents and analyses perceptions of erosion, perceived causes, and attitudes towards possible corrective measures.
6	One-hundred years after shrub encroachment: Policy directions towards sustainable rangeland-use	Daryanto, S.; Fu, B.; Zhao, W.; Wang, L.	Land Use Policy	2019	10.1016/j.landusepol.2019.03.008	4	To encourage adaptation to the provisioning of multiple ecosystem services from shrublands, we provided a framework on how to value such landscapes, including the estimated monetary values that could be generated from maintaining them
6	Smallholder Farmer Adoption of Climate-Related Adaptation Strategies: The Importance of Vulnerability Context, Livelihood Assets, and Climate Perceptions	Shinbrot, X.A.; Jones, K.W.; Rivera-Castañeda, A.; López-Báez, W.; Ojima, D.S.	Environmental Management	2019	10.1007/s00267-019-01152-z	4	"In this study, we analyzed determinants for smallholder farmer adoption of adaptation strategies in Chiapas, Mexico." We conducted 291 surveys with landowners in eight coffee farming communities.
10	What is shaping vulnerability to climate change? The case of laamu atoll, maldives	McNamara, K.E.; Clissold, R.; Piggott-Mckellar, A.; Buggy, L.; Azfa, A.	Island Studies Journal	2019	10.24043/isj.67	4	Drawing from the well-known conceptualisation of vulnerability as a function of exposure, sensitivity, and adaptive capacity, this paper seeks to understand what variables are influencing and shaping vulnerability in Laamu Atoll, the Maldives, and produce a base of knowledge for future vulnerability reduction initiatives.
10	Deconstructing the policyscape for reducing deforestation in the Eastern Amazon: Practical insights for a landscape approach	Gebara, M.F.; Sills, E.; May, P.; Forsyth, T.	Environmental Policy and Governance	2019	10.1002/eet.1846	4	Inspired by the complexity of policy mix analysis, this article seeks to shed light on these interactions by analysing how different policies and measures for reducing deforestation and degradation have played out in a jurisdiction with wide-ranging actors and interventions aimed at shaping their behaviour. Focusing on smallholders, we examine the Sustainable Landscapes Pilot Programme in São Félix do Xingu, looking at how different policies interact—categorising interactions as "complementary," "mutually reinforcing" (synergistic), "in conflict," "interdependent," and/or "redundant"—and explain how proponents of this pilot programme seek to integrate them.
6	Comparison between meteorological data and farmer perceptions of climate change and vulnerability in relation to adaptation	Hasan, M.K.; Kumar, L.	Journal of Environmental Management	2019	10.1016/j.jenvman.2019.02.028	3	This study collected primary data during April–May 2016 from farmers and agriculture officers, and secondary data from local weather stations, government reports and scientific articles. Respondent farmers were selected randomly from three villages of Kalapara sub-district of Patuakhali district of Bangladesh.
6	U.S. farmers' opinions on the use of nontraditional water sources for agricultural activities	Suri, M.R.; Dery, J.L.; Pérodin, J.; Brassill, N.; He, X.; Ammons, S.; Gerdes, M.E.; Rock, C.; Goldstein, R.E.R.	Environmental Research	2019	10.1016/j.envres.2019.02.035	4	A survey was distributed to farmers (n = 746) in the Mid-Atlantic and Southwest regions of the United States (U.S.) about water availability and nontraditional irrigation water perceptions.
2	Maize yield under a changing climate in the Brazilian Northeast: Impacts and adaptation	Martins, M.A.; Tomasella, J.; Dias, C.G.	Agricultural Water Management	2019	10.1016/j.agwat.2019.02.011	4	This paper assessed the potential impacts of climate change on maize productivity in the Brazilian Northeast. To achieve this objective, bias-corrected regional downscaled scenarios from three global models for the representative emission pathways, RCP4.5 and RCP8.5, for the periods 1980–2005, 2007–2040, 2041–2070, and 2071–2099 were used as input data for a crop productivity model.
2	Impacts of irrigation efficiency on agricultural water-land nexus system management under multiple uncertainties—A case study in Amu Darya River basin, Central Asia	Sun, J.; Li, Y.P.; Suo, C.; Liu, Y.R.	Agricultural Water Management	2019	10.1016/j.agwat.2019.01.025	4	In this study, a possibilistic-flexible chance-constrained programming (PFCP) method that is capable of addressing multiple uncertainties expressed as possibilistic distributions, flexible variables, and probabilistic distributions existed in WLNS is developed. PFCP can help gain in-depth analysis of the tradeoffs between system benefit and reliability of satisfying constraints. Then, the proposed PFCP method is applied to the lower reaches of Amu Darya River basin for assessing the impact of irrigation efficiency on the WLNS management, where 1080 scenarios are analyzed in association with different irrigation schemes, violation risk levels, and satisfactory degrees.
2	Drought hazard assessment and possible adaptation options for typical steppe grassland in Xilingol League, Inner Mongolia, China	Li, C.; Wang, J.; Yin, S.; Bao, Y.; Li, Y.; Yu, S.	Theoretical and Applied Climatology	2019	10.1007/s00704-018-2563-9	4	In this study, we conducted a drought hazard analysis based on two drought indices, the precipitation anomaly percentage (Pa) and the standardized precipitation evapotranspiration index (SPEI), using data from a series of meteorological monitoring stations from across the region.
6	Adaption to climate change: a case study of two agricultural systems from Kenya	Stefanovic, J.O.; Yang, H.; Zhou, Y.; Kamali, B.; Ogalleh, S.A.	Climate and Development	2019	10.1080/17565529.2017.1411241	4	This study contributes to a better understanding of climate change adaptation by investigating different farming systems and by including cognitive factors as explanatory variables. We compared a food crop and a horticultural farming system, regarding applied adaptation measures and factors influencing adaptation.
6	An analysis of conservation practice adoption studies in agricultural human-natural systems	Yoder, L.; Ward, A.S.; Dalrymple, K.; Spak, S.; Lave, R.	Journal of Environmental Management	2019	10.1016/j.jenvman.2019.02.009	4	We systematically and critically evaluated the social science adoption literature to address three important gaps: (1) How are adoption studies measuring adoption effectiveness? (2) How do studies integrate individual farmer perspectives into broader institutional (i.e., social and governance) contexts? (3) What are the most prevalent metrics that adoption research uses to characterize the human-natural system?
6	Fishermen's perceptions of coastal fisheries management regulations: Key factors to rebuilding coastal fishery resources in Taiwan	Liao, C.-P.; Huang, H.-W.; Lu, H.-J.	Ocean and Coastal Management	2019	10.1016/j.ocecoaman.2019.01.015	4	Although Taiwan has taken conservation measures for coastal and offshore fishery resources in recent years, the effectiveness of resources rebuilding is unclear. Many initiatives, such as marine protected areas (MPAs), are frequently opposed by fishermen. This research reviewed management measures and interviewed 313 fishermen by purposive stratification and snowball sampling. Data were analyzed by fishery, age, and vessel size to address the attitudes and perceptions of fishermen toward twelve fisheries management measures.
6	Vulnerability of fisherfolks and their perceptions towards climate change and its impacts on their livelihoods in a peri-urban lake system in Zimbabwe	Utete, B.; Phiri, C.; Mlambo, S.S.; Muboko, N.; Fregene, B.T.	Environment, Development and Sustainability	2019	10.1007/s10668-017-0067-x	6	The objectives of this study were to assess the livelihood strategies and assets as well as the vulnerability of peri-urban fisherfolks in Lakes Chivero and Manyame, Zimbabwe.
6	Can agroforestry systems thrive in the drylands? Characteristics of successful agroforestry systems in the arid and semi-arid regions of Latin America	Krishnamurthy, L.; Krishnamurthy, P.K.; Rajagopal, I.; Peralta Solares, A.	Agroforestry Systems	2019	10.1007/s10457-017-0143-0	4	Here, we document the characteristics of replicable, widely practiced agroforestry systems in five climatic regimes across the arid and semi-arid regions of Latin America (dry sub-humid, warm semi-arid, temperate arid, cold arid, and warm arid regions). The research was conducted on 4-6 farms per region using the design and diagnosis method, highlighting that the combination of multi-purpose trees with subsistence crops and livestock is highly context-specific.
6	Impact of community-based organizations on climate change adaptation in agriculture: empirical evidence from Nepal	Khanal, U.; Wilson, C.; Hoang, V.-N.; Lee, B.	Environment, Development and Sustainability	2019	10.1007/s10668-017-0050-6	3	Does not mention smallholders. The purpose of this paper is to examine the impact of community-based organizations (CBOs) on the adoption of agricultural adaptations to climate change impacts. To this end, we first analyze farmers' perceptions on changes in local climatic condition, its impact and adaptations on agriculture based on information collected through a questionnaire survey of 720 farming households in six districts of Nepal.
6	Ecological and social basis for the development of a sand barrier breaching model in Laguna de Rocha, Uruguay	Conde, D.; Solari, S.; de Álava, D.; Rodríguez-Gallego, L.; Verrastro, N.; Chreties, C.; Lagos, X.; Piñeiro, G.; Teixeira, L.; Seijo, L.; Vitancurt, J.; Caymaris, H.; Panario, D.	Estuarine, Coastal and Shelf Science	2019	10.1016/j.ecss.2019.02.003	4	This is the case at Laguna de Rocha, Uruguay, a protected area with international recognition, where the sand barrier opening has been the focus of a long-term conflict. A cooperative effort of scientists, authorities, and local stakeholders produced a breaching protocol, aimed to reduce conflicts while preserving the natural hydrodynamics of the system and its associated ecological processes. Historical information and present perceptions about the sand barrier breach were collected, and geomorphological and hydrological studies were carried out.

6	Transport Accessibility and the Way of Life of the Population in the North: A Case Study of the Sakha (Yakutia) Republic	Kuklina, V.V.; Filippova, V.V.	Geography and Natural Resources	2019	10.1134/S1875372819020094	4	We examine the issues concerning the perception and transformation of transport accessibility in interrelatedness and interdependency with the different ways of life: nomadic, rural and urban.
6	Smallholder telecoupling and climate governance in Jambi Province, Indonesia	Kunz, Y.; Otten, F.; Mardiana, R.; Martens, K.; Roedel, I.; Faust, H.	Social Sciences	2019	10.3390/socsci8040115	4	Applying this framework to case studies from Jambi province, our first case reveals that smallholder certification for so-called sustainable palm oil does not necessarily influence smallholder towards more sustainable management practices. The second case is the setup of an allegedly eco-friendly rubber plantation.
6	An ethnography of policy: Water reuse policy in Kenya	Wakhungu, M.J.	Water Policy	2019	10.2166/wp.2019.160	4	In this paper, policy documents were considered as the ethnographic object to understand how people talk about water reuse in Kenya through policies, plans, regulations and guidelines.
6	Assessment of household perceptions to climate adaptation for resilient rural development planning in India	Singh, N.P.; Anand, B.; Khan, M.A.	Indian Journal of Traditional Knowledge	2019		3	Does not mention smallholders. We collected household level data to understand grass-root perspectives on climate variability, impacts and barriers to adaptation in two different districts; Moga, Punjab and Mahbubnagar, Telangana.
2	Impact of climate change on water resources in the Kilombero Catchment in Tanzania	Näschen, K.; Diekkrüger, B.; Leemhuis, C.; Seregina, L.S.; van der Linden, R.	Water (Switzerland)	2019	10.3390/w11040859	3	This article illustrates the impact of potential future climate scenarios on water quantity in time and space for an East African floodplain catchment surrounded by mountainous areas.
2	Perceptions of U.S. And Canadian maple syrup producers toward climate change, its impacts, and potential adaptation measures	Legault, S.; Houle, D.; Plouffe, A.; Ameztegui, A.; Kuehn, D.; Chase, L.; Blondlot, A.; Perkins, T.D.	PLoS ONE	2019	10.1371/journal.pone.0215511	3	The purpose of this survey study is to present the beliefs and opinions of maple syrup producers of Canada (N = 241) and the U.S. (N = 113) on climate change in general, its impacts on sugar maple health and maple syrup production, and potential adaptation measures.
6	Social preferences for ecosystem services in a biodiversity hotspot in South America	Bidegain, I.; Cerda, C.; Catalán, E.; Tironi, A.; López-Santiago, C.	PLoS ONE	2019	10.1371/journal.pone.0215715	4	In this article, we assess social preferences for ecosystem services in a biodiversity hotspot in central Chile. We use a consultative case study to ask local stakeholders (n = 70) from the Campana Peñuelas Biosphere Reserve to identify the most important ecosystem services the area provides for them and inquire about the perceived vulnerability of the services to changes in the future.
6	Is "perceived water insecurity" associated with disaster risk perception, preparedness attitudes, and coping ability in rural China? (A health-EDRM pilot study)	Ho, J.Y.-E.; Chan, E.Y.Y.; Lam, H.C.Y.; Yeung, M.P.S.; Wong, C.K.P.; Yung, T.K.C.	International Journal of Environmental Research and Public Health	2019	10.3390/ijerph16071254	4	The purpose of this study was to explore the relationship between perceived water security and disaster risk perception in a rural ethnic minority community.
6	Eutrophication overrides warming as a stressor for a temperate African seagrass (Zostera capensis)	Mvungi, E.F.; Pillay, D.	PLoS ONE	2019	10.1371/journal.pone.0215129	4	Here, we report on laboratory experiment assessing the main and joint effects of warming and nutrient enrichment on Cape eelgrass (Zostera capensis) from the West coast of South Africa, in which morphological attributes, photosynthetic efficiency and elemental content were assessed.
6	Heat stress perception among native and migrant workers in italian industries—case studies from the construction and agricultural sectors	Messeri, A.; Morabito, M.; Bonafede, M.; Bugani, M.; Levi, M.; Baldasseroni, A.; Binazzi, A.; Gozzini, B.; Orlandini, S.; Nybo, L.; Marinaccio, A.	International Journal of Environmental Research and Public Health	2019	10.3390/ijerph16071090	3	For this reason, the present study evaluated heat-stress perception and management among native and immigrant workers in Europe.
2	Evaluating traditional knowledge on climate change (TKCC): A case study in the central dry zone of Myanmar	Zin, W.Y.L.; Teartisup, P.; Kerdseub, P.	Environment and Natural Resources Journal	2019	10.32526/ennrj.17.2.2019.09	6	Location: Central Dry Zone (CDZ) of Myanmar. Does not mention smallholders.
6	Adaptation to climate change and its impacts on wheat yield: Perspective of farmers in Henan of China	Quan, S.; Li, Y.; Song, J.; Zhang, T.; Wang, M.	Sustainability (Switzerland)	2019	10.3390/su1101928	3	This study focuses on Henan province due to its significance in China's cereal production. Located in central China, Henan Province is one of the thirteen major grain cultivating areas.
2	New indicators of vulnerability and resilience of agroforestry systems to climate change in West Africa: West African agroforestry systems and climate change	Gnonlonfoun, I.; Assogbadjo, A.E.; Gnanglè, C.P.; Glèlè Kakaï, R.L.	Agronomy for Sustainable Development	2019	10.1007/s13593-019-0566-2	4	The objectives of the study were to (i) assess the effect of changes in climatic conditions on agroforestry systems, (ii) assess the endogenous indicators of vulnerability of agroforestry systems to climate change, and (iii) analyze agroforestry and cropping systems' resilience to climate change.
6	Rhythms of prediction in South Australian water resource management	Rayner, S.	Weather, Climate, and Society	2019	10.1175/WCAS-D-18-0103.1	4	In the complex institutional and physical infrastructure nexus of South Australia, weather and climate information is highly valued by freshwater managers and users. But different users focus on very different time scales.
6	Farmers' perceptions of agricultural land use changes in Nepal and their major drivers	Paudel, B.; Zhang, Y.; Yan, J.; Rai, R.; Li, L.	Journal of Environmental Management	2019	10.1016/j.jenvman.2019.01.091	3	Does not mention smallholders. This study utilizes historical agricultural area, population, and climate data for 1910–2010, combined with a series of applied household surveys and focus group discussions to assess farmers' perceptions of these changes and identify the major drivers. The total area of agricultural land in Nepal has expanded rapidly since 1910, more intensively in the southern (Tarai) and central (Hill) ecological regions of the country, and has decreased slightly near large cities in recent decades.
2	The role of risk preferences and loss aversion in farmers' energy-efficient appliance use behavior	He, R.; Jin, J.; Gong, H.; Tian, Y.	Journal of Cleaner Production	2019	10.1016/j.jclepro.2019.01.076	4	This paper explores the effect of farmers' risk preferences and loss aversion on their energy-efficient appliance use behavior in rural China.
6	Strengthening the science-policy interface for climate adaptation: stakeholder perceptions in Cameroon	Nkiaka, E.; Lovett, J.C.	Regional Environmental Change	2019	10.1007/s10113-018-1441-4	3	In this study, Q methodology was used to capture perspectives from "multi-level" stakeholders holding different viewpoints about climate change in order to strengthen the SPI for climate adaptation in Cameroon. Stakeholders include government ministers, heads of government research institutions, and heads of international organizations and NGOs.
6	Farm ponds in southern China: Challenges and solutions for conserving a neglected wetland ecosystem	Chen, W.; He, B.; Nover, D.; Lu, H.; Liu, J.; Sun, W.; Chen, W.	Science of the Total Environment	2019	10.1016/j.scitotenv.2018.12.394	4	This paper presents the first synthetic perspective on the ecological roles of farm ponds in agriculturally dominated developing countries. The analytical framework and conservation suggestions are referential to sustainable rural development and the management of other small, scattered wetlands.
6	Perceived climate risks and adaptation drivers in diverse coffee landscapes of Uganda	Mulinde, C.; Majaliwa, J.G.M.; Twinomuhangi, R.; Mfitumukiza, D.; Komutunga, E.; Ampaire, E.; Asiimwe, J.; Van Asten, P.; Jassogne, L.	NJAS - Wageningen Journal of Life Sciences	2019	10.1016/j.njas.2018.12.002	3	This study empirically provides evidence of diversity of rural coffee farm-households and climate vulnerabilities in Uganda.
6	Carbon and water footprints of Brazilian mango produced in the semiarid region	Müller Carneiro, J.; Dias, A.F.; Barros, V.S.; Giongo, V.; Folegatti Matsuura, M.I.S.; Brito de Figueirêdo, M.C.	International Journal of Life Cycle Assessment	2019	10.1007/s11367-018-1527-8	4	This study presents the carbon and water footprint of packed mango produced in Vale do São Francisco, the main irrigated valley in Brazil. It provides an approach to identify the critical processes and opportunities for improvements in the conventional crop system that may support producers in the task of developing future site-specific assessments.

2	The El Niño event of 2015-2016: Climate anomalies and their impact on groundwater resources in East and Southern Africa	Rao Kolusu, S.; Shamsudduha, M.; Todd, M.C.; Taylor, R.G.; Seddon, D.; Kashaigili, J.J.; Ebrahim, G.Y.; Cuthbert, M.O.; Sorensen, J.P.R.; Villholth, K.G.; Macdonald, A.M.; Macleod, D.A.	Hydrology and Earth System Sciences	2019	10.5194/hess-23-1751-2019	4	Here, we assess the climate anomalies that occurred over Southern Africa (SA) and East Africa, south of the Equator (EASE), during the major El Niño event of 2015-2016, and their associated impacts on groundwater storage, across scales, through analysis of in situ groundwater piezometry and Gravity Recovery and Climate Experiment (GRACE) satellite data.
6	Seeing is not always believing: Crop loss and climate change perceptions among farm advisors	Niles, M.T.; Wiener, S.; Schattman, R.E.; Roesch-Mcnally, G.; Reyes, J.	Environmental Research Letters	2019	10.1088/1748-9326/aafbb6	3	Here we couple survey data from United States Department of Agriculture farm service employees (n = 6, 514) with historical crop loss data across the United States to explore the relationship of actual climate-related crop losses on farm to farm advisor perceptions of climate change and future farmer needs.
6	Identifying multiple stressors that influence eutrophication in a Finnish agricultural river	Rankinen, K.; Cano Bernal, J.E.; Holmberg, M.; Vuorio, K.; Granlund, K.	Science of the Total Environment	2019	10.1016/j.scitotenv.2018.12.294	4	We combined eco-hydrological and empirical models to study chlorophyll-a concentration as an indicator of eutrophication in a small agricultural river. We used a modified story-and-simulation method to build three storylines for possible changes in future land use due to climate change and political change. The main objective in the first storyline is to stimulate economic activity but also to promote the sustainable and efficient use of resources.
10	Use and perceptions of alternative economic activities among smallholder coffee farmers in Huehuetenango and El Quiché departments in Guatemala	Gerlicz, A.; Méndez, V.E.; Conner, D.; Baker, D.; Christel, D.	Agroecology and Sustainable Food Systems	2019	10.1080/21683565.2018.1532480	4	More recently, many farmers have suffered crop losses in the wake of the spread of coffee leaf rust disease, and researchers are predicting that some areas will become less suitable for coffee growing in the near future as a result of climate change. Many have called for the promotion of livelihood diversification as an additional component of rural development programs. This study uses thematic analysis of transcripts from 15 interviews with members of a regional Guatemalan coffee cooperative, Asociación Barillense de Agricultores, based on four different interview guides.
6	Climate change evidence and community level autonomous adaptation measures in a canal irrigated agriculture system of Pakistan	Bhatti, M.T.; Ahmad, W.; Shah, M.A.; Khattak, M.S.	Climate and Development	2019	10.1080/17565529.2018.1442803	4	This paper predicts climate change pattern and outlines suitable adaptation strategies related to irrigated agricultural practices in Hakra Branch Canal Command (HBCC) of Pakistan. Climate change predictions were simulated using models perturbed with climatic data and A2 emission scenario.
6	Training Transdisciplinary Educators: Intercultural Learning and Regenerative Practices in Ecuador	Collado-Ruano, J.; Madroñero-Morillo, M.; Álvarez-González, F.	Studies in Philosophy and Education	2019	10.1007/s11217-019-09652-5	4	The main goal of this article is to explain the transdisciplinary training model developed at the National University of Education (UNAE) in Ecuador, based on the ancestral worldviews of Buen Vivir (Good Living).
6	Perceptions of ecosystem services provision performance in the face of climate change among communities in Bobirwa sub-district, Botswana	Mugari, E.; Masundire, H.; Bolaane, M.; New, M.	International Journal of Climate Change Strategies and Management	2019	10.1108/IJCCSM-09-2017-0178	4	This study therefore aims to provide recent knowledge and evidence of consequences of environmental change on semi-arid arid landscapes and communities.
6	Farmers' adaptation choices to climate change: A case study of wheat growers in Western Iran	Azadi, Y.; Yazdanpanah, M.; Forouzani, M.; Mahmoudi, H.	Journal of Water and Climate Change	2019	10.2166/wcc.2018.242	4	The objectives of this study were to evaluate the farmers' ongoing adaptation measures, and to identify factors that influence their choice of adaptation methods in wheat production in the Kermanshah district in Western Iran.
2	Appraisal of awareness level of farmers regarding biodiversity conservation in district Sargodha, Punjab, Pakistan	Ashraf, E.; Shurjeel, H.K.; Fatima, N.; Babar, R.; Haq, I.	Sarhad Journal of Agriculture	2019	10.17582/journal.sja/2019/35.1.244.252	4	The present study was aimed to determine the awareness level of the respondents regarding biodiversity conservation.
6	Farmers' perceptions of climate change and farm-level adaptation strategies: Evidence from Bassila in Benin	Diendéré, A.A.	African Journal of Agricultural and Resource Economics	2019		3	Does not mention smallholders.
2	Performance of Indian agricultural export-an analysis	Gunaseelan, S.; Kesavan, N.	Indian Journal of Public Health Research and Development	2019	10.5958/0976-5506.2019.00489.3	4	The present analytical paper has been written for the awareness on Indian agricultural export and its impact on the GDP growth during the present decade.
6	Why do smallholder farmers dis-adopt conservation agriculture? Insights from Malawi	Chinseu, E.; Dougill, A.; Stringer, L.	Land Degradation and Development	2019	10.1002/ldr.3190	4	This article examines farmers' lived experiences and perceptions of CA to understand why smallholder farmers dis-adopt CA in Malawi.
2	Crop yield sensitivity of global major agricultural countries to droughts and the projected changes in the future	Leng, G.; Hall, J.	Science of the Total Environment	2019	10.1016/j.scitotenv.2018.10.434	4	We use crop-country specific standardized precipitation index (SPI) and census yield data for 1961–2016 to build a probabilistic modeling framework for estimating yield loss risk under a moderate ($-1.2 < SPI < -0.8$), severe ($-1.5 < SPI < -1.3$), extreme ($-1.9 < SPI < -1.6$) and exceptional ($SPI < -2.0$) drought.
6	Greening the Dark Side of Chocolate: A Qualitative Assessment to Inform Sustainable Supply Chains	Camargo, M.C.; Hogarth, N.J.; Pacheco, P.; Nhantumbo, I.; Kanninen, M.	Environmental Conservation	2019	10.1017/S0376892918000243	4	The main purpose is to understand the key factors that could facilitate a transition to a more sustainable supply while harmonizing the multiple actors' interests.
6	Gender and climate policy: a discursive institutional analysis of Ethiopia's climate resilient strategy	Mersha, A.A.; van Laerhoven, F.	Regional Environmental Change	2019	10.1007/s10113-018-1413-8	4	Applying a discursive institutional analysis, we aim to explain the interaction among policy actors and the influence thereof on the extent to which adaptation policy in response to climate change becomes gender responsive.
6	Climate change impacts and forest adaptation in the Asia–Pacific region: from regional experts' perspectives	Wang, G.; Mang, S.L.; Riehl, B.; Huang, J.; Wang, G.; Xu, L.; Huang, K.; Innes, J.	Journal of Forestry Research	2019	10.1007/s11676-018-0827-y	4	This study surveys experts in forestry and climate change from the Asia–Pacific region to gauge their perspectives on the impacts of climate change and on the challenges faced by forest adaptation in the region, and explores recommendations and initiatives for adapting forests to climate change.
6	Meat Consumption and Green Gas Emissions: a Chemometrics Analysis	Chapman, J.; Power, A.; Chandra, S.; Cozzolino, D.	Food Analytical Methods	2019	10.1007/s12161-018-1378-8	4	The aim of this study was to relate greenhouse gas emissions (GHGE) from both livestock production (enteric) and agriculture emissions with the consumption of meat from meat producer and importer countries. Data for meat consumption and emission levels of agriculture and livestock production were sourced from the Food and Agriculture Organisation (FAO) database statistics (1961 to 2013).
6	Farmers' perception on agro-ecological implications of climate change in the Middle-Mountains of Nepal: a case of Lumle Village, Kaski	Pandey, R.	Environment, Development and Sustainability	2019	10.1007/s10668-017-0031-9	4	This study investigates the implications of climate change on agricultural ecology of Lumle Village as a representative example of the Middle-Mountains of Nepal.
6	Ecosystem-based management planning across aquatic realms at the Ria de Aveiro Natura 2000 territory	Lillebø, A.I.; Teixeira, H.; Morgado, M.; Martínez-López, J.; Marhubi, A.; Delacámara, G.; Strosser, P.; Nogueira, A.J.A.	Science of the Total Environment	2019	10.1016/j.scitotenv.2018.09.317	4	The main objective is to elaborate on the co-development of the EBM planning process across the three water domains, all characterized by high biodiversity and by the wide range of services provided by ecosystems and their abiotic components, for the mitigation of impacts from the management plan under implementation.

6	Let the people speak: improving regional adaptation policy by combining adaptive capacity assessments with vulnerability perceptions of farmers in Gujarat, India	Stock, R.; Birkenholtz, T.; Garg, A.	Climate and Development	2019	10.1080/17565529.2017.1410089	4	Using qualitative methods, we conducted adaptive capacity assessments and assessed vulnerability perceptions in 3 villages, involving 120 farmers from diverse socioeconomic backgrounds. Combining vulnerability perceptions with adaptive capacity assessments, we better observed the mismatch between rural development policy with the potential to aid in adaptation processes that address local needs, identifying why policy fails to increase the adaptive capacity of the agriculturalists most vulnerable to climate impacts.
2	Including variability across climate change projections in assessing impacts on water resources in an intensively managed landscape	Han, B.; Benner, S.G.; Flores, A.N.	Water (Switzerland)	2019	10.3390/w11020286	4	Here we combine a stochastic weather generator together with future projections of climate change to efficiently create a large ensemble of daily weather for three climate scenarios, reflecting recent past and two future climate scenarios.
2	Techno-economic analysis of a small-scale biomass-to-energy BFB gasification-based system	Porcu, A.; Sollai, S.; Marotto, D.; Mureddu, M.; Ferrara, F.; Pettinau, A.	Energies	2019	10.3390/en12030494	4	This goal can be pursued by promoting the diffusion of advanced technologies for power generation from renewable energy sources. In this field, biomass can play a very important role since, differently from solar and wind, it can be considered a programmable source. This paper reports a techno-economic analysis on the possible commercial application of gasification technologies for small-scale (2 MW e) power generation from biomass.
2	Perception of climate change in shrimp-farming communities in bangladesh: A critical assessment	Kais, S.M.; Islam, M.S.	International Journal of Environmental Research and Public Health	2019	10.3390/ijerph16040672	3	Does not mention smallholders. In order to understand how the shrimp-farming communities in coastal Bangladesh perceive current climate instabilities, we conducted a qualitative study in shrimp-farming villages in coastal Bangladesh where about 80% of commercial shrimp of the country is cultivated.
6	Systemic risks of climate events and households' participation in mariculture mutual insurance: A case study of shrimp producers in Zhejiang Province	Han, H.; Jiang, Y.	Sustainability (Switzerland)	2019	10.3390/su11041164	4	Based on the field surveyed data of mariculture shrimp producers in Zhejiang Province, this study aims to examine the determinants underlying households' participation in mariculture mutual insurance. Based on logistic model, we find out that climate risks, environmental risks and technical risks have seriously hindered the development of food security and fisheries in Zhejiang Province.
6	Understanding the values behind farmer perceptions of trees on farms to increase adoption of agroforestry in Australia	Fleming, A.; O'Grady, A.P.; Mendham, D.; England, J.; Mitchell, P.; Moroni, M.; Lyons, A.	Agronomy for Sustainable Development	2019	10.1007/s13593-019-0555-5	4	In many parts of the world, the benefits of agroforestry remain under-realised. To understand the reasons behind this, interviews were conducted with 44 predominantly mixed enterprise farmers and farm advisors in Tasmania, Australia. Discourse analysis identified three groups of values driving perceptions and behaviours relating to agroforestry, trees as an economic proposition, trees as uneconomic and trees as essential regardless of economics.
6	On the linkage between runoff generation, land drainage, soil properties, and temporal patterns of precipitation in agricultural floodplains	Sofia, G.; Ragazzi, F.; Giandon, P.; Dalla Fontana, G.; Tarolli, P.	Advances in Water Resources	2019	10.1016/j.advwatres.2018.12.003	4	This study examines soil moisture conditions, soil texture and rainfall characteristics, together with different artificial drainage network structures covering a time-span of 100 years (1924–2010), as drivers for runoff production in an agricultural floodplain.
6	Constraints on farmer adaptability in the Iowa-Cedar River Basin	Bitterman, P.; Bennett, D.A.; Secchi, S.	Environmental Science and Policy	2019	10.1016/j.envsci.2018.11.004	3	We report the results of a survey of farmer adaptability in the Iowa-Cedar River Basin in eastern Iowa.
6	Climate change and occupational heat stress risks and adaptation strategies of mining workers: Perspectives of supervisors and other stakeholders in Ghana	Nunfam, V.F.; Van Etten, E.J.; Oosthuizen, J.; Adusei-Asante, K.; Frimpong, K.	Environmental Research	2019	10.1016/j.envres.2018.11.004	3	The sample size (19) respondents consisted of 16 supervisory personnel (e.g., workplace hygienists; health, safety, and environmental officers) and three officials of the other (external) stakeholders (Ghana Chamber of Mines[GCM]; Inspectorate Division of the Minerals Commission [IDMC]; and Ghana National Association of Small Scale Miners [GNASSM]) of Artisanal Small Scale and Large Scale Mining Companies in Ghana.
6	An investigation of coastal vulnerability and internal consistency of local perceptions under climate change risk in the southwest part of Bangladesh	Rakib, M.A.; Sasaki, J.; Pal, S.; Newaz, M.A.; Bodrud-Doza, M.; Bhuiyan, M.A.H.	Journal of Environmental Management	2019	10.1016/j.jenvman.2018.10.054	3	Interviews were conducted with local businessmen, floating farmers, fishermen, honey collectors, day laborers, travelers, and some other unspecified people.
6	Targeting climate change adaptation strategies to small-scale private forest owners	Mostegl, N.M.; Pröbstl-Haider, U.; Jandl, R.; Haider, W.	Forest Policy and Economics	2019	10.1016/j.forpol.2017.10.001	4	Therefore, this study aimed to investigate the motivations for forest ownership, current management practices, and perception of and adaptability to climate change, to discuss successful approaches for information campaigns, advisory services, and monetary incentives. The study applied a questionnaire with an embedded choice experiment, which obtained a thorough understanding of the salient factors influencing decision-making by surveying 919 forest owners across Austria.
2	Evaluating climate change adaptation through evacuation decisions: a case study of cyclone management in India	Das, S.	Climatic Change	2019	10.1007/s10584-018-2292-1	4	With increasing threats from climate change, it is essential that the effectiveness of such measures is evaluated and limitations are addressed. The State of Odisha in Eastern India had witnessed nearly 10 years of such capacity building for cyclone management when it was hit by the severe cyclone "Phailin" in 2013.
6	Climate change adaptation in the Delta Nile Region of Egypt: Implications for agricultural extension	Kassem, H.S.; Bello, A.R.S.; Alotaibi, B.M.; Aldosri, F.O.; Straquadine, G.S.	Sustainability (Switzerland)	2019	10.3390/su11030685	4	A workshop was organized for 59 extension professionals working in the two governorates, looking at how the adaptive capacity of the agricultural sector towards climate change was being guided by policy-makers.
6	Linking social perception and provision of ecosystem services in a sprawling urban landscape: A case study of Multan, Pakistan	Manzoor, S.A.; Malik, A.; Zubair, M.; Griffiths, G.; Lukac, M.	Sustainability (Switzerland)	2019	10.3390/su11030654	4	Here, we spatially examined land use changes in Multan, Pakistan, and investigated public perception about urban sprawl and its impacts on the quality and provision of ecosystem services, using a survey instrument.
6	Traditional Kiribati beliefs about environmental issues and its impacts on rural and urban communities	Aretaake, R.	Disaster Prevention and Management: An International Journal	2019	10.1108/DPM-06-2018-0182	8	The purpose of this paper is to report how the encouragement of collaboration between local stakeholders, communities and the government helps slow the great impact of disaster risks and the impacts of climate change on livelihoods and lives. It also describes how promoting the acceptance and contributions of traditional knowledge in this effort owing to their accessibility and affordability and their cultural compatibility with the community contributes to addressing the challenges in Kiribati faces. Drawing on government and NGO reports, as well as other documentary sources, this paper examines the nature of current efforts and the state of community practices in Kiribati.
6	Crop Growers' Adaptive Capacity to Climate Change: A Situated Study of Agriculture in Arizona's Verde Valley	Douglass-Gallagher, E.; Stuart, D.	Environmental Management	2019	10.1007/s00267-018-1114-6	3	This study explores the adaptive capacity of crop growers in the Verde Valley, Arizona (US).
6	Farmer Perceptions of Climate Change, Observed Trends and Adaptation of Agriculture in Pakistan	Abid, M.; Scheffran, J.; Schneider, U.A.; Elahi, E.	Environmental Management	2019	10.1007/s00267-018-1113-7	3	Does not mention smallholders. Using cross-sectional data of 450 farmers collected from three agro-ecological zones of Punjab, Pakistan.
6	E-mobility in agriculture: differences in perception between experienced and non-experienced electric vehicle users	Riedner, L.; Mair, C.; Zimek, M.; Brudermann, T.; Stern, T.	Clean Technologies and Environmental Policy	2019	10.1007/s10098-018-1615-2	4	The present paper focuses on the differences in perceptions between experienced and non-experienced electric vehicle users.

6	The impact of crop farmers' decisions on future land use, land cover changes in Kintampo North Municipality of Ghana	Bessah, E.; Bala, A.; Agodzo, S.K.; Okhimamhe, A.A.; Boakye, E.A.; Ibrahim, S.U.	International Journal of Climate Change Strategies and Management	2019	10.1108/IJCCSM-05-2017-0114	4	This paper aims to assess the rate and land category contributing to the changes in seven land-uses in the Kintampo North Municipality of Ghana and the effect of the decisions of land users on future landscapes.
6	Decline in climate resilience of european wheat	Kahiluoto, H.; Kaseva, J.; Balek, J.; Olesen, J.E.; Ruiz-Ramos, M.; Gobin, A.; Kersebaum, K.C.; Taká, J.; Ruget, F.; Ferrise, R.; Bezak, P.; Capellades, G.; Dibari, C.; Mäkinen, H.; Nendel, C.; Ventrella, D.; Rodríguez, A.; Bindi, M.; Trnka, M.	Proceedings of the National Academy of Sciences of the United States of America	2019	10.1073/pnas.1804387115	4	Here, we show a decline in the response diversity of wheat in farmers' fields in most European countries after 2002–2009 based on 101,000 cultivar yield observations.
10	'There are new species': indigenous knowledge of biodiversity change in Arctic Yakutia	Ksenofontov, S.; Backhaus, N.; Schaepman-Strub, G.	Polar Geography	2019	10.1080/1088937X.2018.1547326	4	This study presents indigenous people's perceptions of changes and trends in biodiversity in Arctic Yakutia in Northeastern Siberia, Russia.
6	Agriculture-specific determinants of carbon footprint	Balogh, J.M.	Studies in Agricultural Economics	2019	10.7896/j.1918	4	The paper aims to explore what agriculture-specific factors influence the carbon footprint at a global level based on 1961-2013 data.
2	Extension Agents' Perceptions of Climate Change and Training Needs	de Koff, J.P.; Broyles, T.W.	Natural Sciences Education	2019	10.4195/nse2019.01.0001	3	There is little research, however, related to agents' perceptions of and needs for climate change–related information and no research in the southeastern United States. Survey research was conducted in 2018 with all extension agents in Tennessee.
6	Determinants of intensity of utilization of Baobab products in Kenya	Kiprotich, C.; Kavoi, M.M.; Mithöfer, D.	Cogent Food and Agriculture	2019	10.1080/23311932.2019.1704163	4	This study examined factors influencing intensity of utilization of baobab products in Kenya.
6	Creativity, innovation and future - The key points regarding the architecture for the production of agro-textiles	Cărpus, E.; Dorogan, A.; Matache, M.-G.; Vlăduţ, V.; Muscalu, A.	Industria Textila	2019	10.35530/IT.070.06.1624	4	Given the increasing awareness of the environment and the specific knowledge of the various interdisciplinary technologies, special attention has been paid to unconventional technical applications, such as the use of textile structures in the agriculture and horticulture sectors to increase the quality and efficiency of agro-food products in terms of ensuring a healthy environment, social economic equity and a profitable economy.
10	Challenges faced by rural people in mitigating the effects of climate change in the Mazungunye communal lands, Zimbabwe	Nyahunda, L.; Tirivangasi, H.M.	Jamba: Journal of Disaster Risk Studies	2019	10.4102/JAMBA.V11I1.596	4	This study aims at exploring challenges faced by rural people in mitigating the effects of climate change in the Mazungunye community, Masvingo Province, in Zimbabwe. The objectives of the study were to identify the challenges that impede effective adaptation of rural people to climate change hazards and to examine their perceptions on how to foster effective adaptation.
10	Subsistence farmers' knowledge in developing integrated critical pedagogy education curricula	Govender, N.	Education as Change	2019	10.25159/1947-9417/5841	4	This study explored the diversity of knowledge of subsistence farmers with regard to their community farming practices and how their knowledge, skills and resilience can be harnessed for education.
6	Perceived Importance of Climate Change Adaptation and Mitigation According to Social and Medical Factors among Residents of Impacted Communities in the United States	Kreslake, J.M.	Health Equity	2019	10.1089/heq.2019.0002	3	To determine whether perceived importance of local climate change adaptation and mitigation efforts differs according to social or medical factors among residents of impacted communities. An online survey was conducted among residents of California (Los Angeles/Orange), Florida (Miami-Dade/Broward), and Arizona (Maricopa) counties in July 2018 (n=605).
2	Sustainable irrigation management and farmers' knowledge in South Khorasan, Iran	Bakhshi, A.; Cecchini, L.; Ghanian, M.; Pour, B.K.; Santucci, F.M.	International Journal of Sustainable Society	2019	10.1504/IJSSOC.2019.104567	4	This paper presents the results of a study investigating groundwater management in Iran, where water is private and its allocation still follows traditional rules.
10	Agritourism as a sustainable adaptation option for climate change	Mahaliyanaarachchi, R.P.; Elapata, M.S.; Esham, M.; Madhuwanthi, B.C.H.	Open Agriculture	2019	10.1515/opag-2019-0074	3	Does not mention smallholders. This study investigated the perception of farmers on climate change and the potential of agritourism as a sustainable adaptation option to mitigate the negative impacts of climate change in both tourism and agricultural sectors.
2	Adoption of climate-smart droughttego® varieties in Kenya	Muinga, G.; Marechera, G.; Macharia, I.; Mugo, S.; Rotich, R.; Oniang'o, R.K.; Obunyali, C.O.; Oikeh, S.O.	African Journal of Food, Agriculture, Nutrition and Development	2019	10.18697/ajfand.87.18355	3	African Agricultural Technology Foundation (AATF) promotes DroughtTEGO® drought-tolerant maize hybrids developed by Water Efficient Maize for Africa (WEMA) project in partnership with CIMMYT, Monsanto and five National Agricultural Research Systems for Kenya, Uganda, Tanzania, Mozambique, and South Africa to address the impact of drought occasioned by climate change. To determine the level of adoption and use of DroughtTEGO® maize hybrids in Kenya, a survey was conducted involving 642 farming households from six counties.
6	Blue Economy threats, contradictions and resistances seen from South Africa	Bond, P.	Journal of Political Ecology	2019	10.2458/v26i1.23504	4	Given how climate change has become devastating to vulnerable coastlines-such as central Mozambique's, victim of two of the Southern Hemisphere's most intense cyclones in March-April 2019-it is essential to better link ocean defence mechanisms to climate activism: global youth Climate Strikes and the direct action approach adopted by the likes of Dakota Access Pipe Line resistance in the US, Extinction Rebellion in Britain, and Ende Gelande in Germany. Today, as the limits to capital's crisis-displacement tactics are becoming more evident, it is the interplay of these top-down and bottom-up processes that will shape the future Blue Economy narrative, giving it either renewed legitimacy, or the kind of illegitimacy already experienced in so much South African resource-centric capitalism.
6	Ecotourism based on the observation of sea turtles–A sustainable solution for the touristic promotion of são tomé and príncipe	Mendes, S.; Martins, J.; Mouga, T.	Cogent Social Sciences	2019	10.1080/23311886.2019.1696001	4	This study addressed the recent ecotourism activities in the observation of sea turtles which are being developed in São Tomé and Príncipe.
6	REDD+ Implementation in community-based muyong forest management in Ifugao, Philippines	Avtar, R.; Tsusaka, K.; Herath, S.	Land	2019	10.3390/land8110164	4	The aim of the study is to qualitatively assess the forest management practices in the muyong forest and the way forward to implement the United Nations-Reducing Emissions from Deforestation and Forest Degradation (REDD+) mechanism.
6	Using farmer storytelling to build understanding of our New Weather Reality	Roche, E.H.; Mallory, E.B.; Birthisel, S.K.	New Weather Reality	2019		3	A storytelling session was successful in raising awareness and understanding of the types of changes in weather patterns farmers are experiencing in Maine, what impacts those changes are having on their operations, and the changes farmers are making in response. Using an outreach approach rooted in farmer stories allowed us to bypass the controversy that often surrounds topics related to climate change.
6	Climate change adaptation: a corrective policy framework in the Malaysian agricultural sector	Akhtar, R.; Masud, M.M.; Noman, A.H.M.; Jabin, N.; Alam, A.S.A.F.	International Journal of Environment and Sustainable Development	2019	10.1504/IJESD.2019.103465	3	The main objective of this study is to explore their socio-economic status and general perception of climate change and to examine its impact on adaptation practices.

6	Land investments, food systems change and democracy in Kenya and Mozambique	Dekeyser, K.	Politics and Governance	2019	10.17645/pag.v7i4.2101	4	Does not mention smallholders. This article positions large land investments in food system changes in central Kenya and northern Mozambique based on a large-scale household survey and interviews, and uses these findings to debate the concept of food democracy. It is hoped that the findings of this study would be useful for policymakers in designing an appropriate policy framework to raise awareness of how to reduce the impact of climate change in the agricultural sector.
6	Undergraduate perceptions of climate education exposure in natural resources management	Nelson, N.G.; Montefiore, L.; Anthony, C.; Merriman, L.; Kuster, E.; Fox, G.A.	Transactions of the ASABE	2019	10.13031/trans.13361	3	In this study, we characterize recent trends in undergraduates' perceived exposure to climate education across the U.S. by analyzing responses to a national survey of graduate students who attended undergraduate institutions in the U.S. (n = 423).
6	Coping strategies of farmers regarding the impact of climate change in Rice-Wheat zone of the Punjab, Pakistan	Akhtar, M.S.; Maann, A.A.; Awan, K.A.; Shahbaz, B.	Pakistan Journal of Agricultural Sciences	2019	10.21162/PAKJAS/19.8089	3	Does not mention smallholders. The main objective of the present study was to find out the factors affecting the strategies of farmers regarding the impact of climate change in Punjab, Pakistan. Three districts from rice-wheat cropping zone (Narowal, Sialkot and Gujranwala) were selected randomly.
2	Farmers perception of agricultural extension services in disseminating climate change knowledge	Afsar, N.; Idrees, M.	Sarhad Journal of Agriculture	2019	10.17582/journal.sja/2019/35.3.942.947	3	Does not mention smallholders. Present research was done to know the farmers perceptions about agricultural extension services in disseminating climate change knowledge in Khyber Pakhtunkhwa.
16	Determinants of oil palm smallholder farmers' adaptation strategy to climate change in Bengkulu, Indonesia	Irawan, A.; Syakir, M.	Revista de Economia e Sociologia Rural	2019	10.1590/1806-9479.2019.186452	4	The aim of the study is to define how the determinant factors influence the oil palm smallholder farmer's adaptation strategies on climate change in Bengkulu Province, Indonesia.
2	Climate change-farmers' perception, adaptation and impact on agriculture in the Lakki Marwat District of Khyber Pakhtunkhwa	Ahmad, R.; Zulfiqar, M.	Sarhad Journal of Agriculture	2019	10.17582/journal.sja/2019/35.3.880.889	3	Does not mention smallholders. Climate change related research remained a poorly investigated area in KP and instant study filled that gap by investigating farmers' perceptions and adaptation about change in climate and impact of change in climate on wheat productivity in Lakki Marwat. A combination of multi-stage sampling and simple random sampling used to select five Union Councils (UCs), one village council from each UC and one village from each village council.
6	Factors causing failure of the REDD+ program implementation in central Kalimantan	Lestari, N.	Jurnal Manajemen Hutan Tropika	2019	10.7226/jtfm.5.1.28	4	This study aims to investigate the causes of failure in implementing the REDD+ program in Central Kalimantan by using the bottom-up implementation model.
2	Attitude and risk perception of climate change in farming communities in Tripoli, Libya	İlseven, S.; Aslanova, F.; Anakua, M.M.A.; Laama, I.F.G.; Aljwadi, S.O.K.; Ayouz, H.	Chimica Oggi/Chemistry Today	2019		3	Does not mention smallholders. This study investigated attitudes and risk perceptionsof climate change in farming communities in Tripoli, Libya. Tripoli is a capital of Lybia.
6	Pennsylvania agricultural producers' observations of changing environmental conditions: Implications for research and Extension	Thorn, K.; Radhakrishna, R.; Tobin, D.	Journal of Extension	2019		4	To understand environmental conditions Pennsylvania agricultural producers had observed in the past and what their environmental concerns were for the future, we conducted a statewide survey. We used Spearman rank order correlations to show differences between past observations and future concerns regarding environmental conditions and found a disconnect between what respondents previously had observed and their anticipations for the future.
2	Gender and perception of climate change in Ethiopia	Floro, M.; Yesuf, M.; Woldesenbet, T.	International Journal of Climate Change: Impacts and Responses	2019	10.18848/1835-7156/CGP/v11i02/21-39	3	Does not mention smallholders. This article empirically examines whether there is any gender difference in perception of climate change among rural women and men in Ethiopia.
6	Socializing the rain: Human adaptation to ecological variability in a fishery, Mweru-Luapula, Zambia	Annear, C.M.; Waylen, P.R.	Journal of Political Ecology	2019	10.2458/V26I1.23246	4	This article presents and analyzes annual rainfall in the fishery from 1916-1992 and quantitative fish market data comprised of observed fish catch numbers by species in three markets from September 2004 to September 2005.
2	Changing the perception of smallholder farmers about cactus pear in Pakistan	Louhaichi, M.; Islam, M.; Hassan, S.; Qamar, I.A.; Sarker, A.	Acta Horticulturae	2019	10.17660/ActaHortic.2019.1247.18	4	The aim of this study was to promote O. ficus-indica as a feed resource for livestock, as it is a drought-resistant succulent plant that is spineless and holds a large amount of water. This study examined the adoption of cactus in Pakistan, through targeting 100 households selected from three strata groups: farmers not familiar with, farmers familiar with, and farmers who had already adopted cactus.
6	Climate change perspective in mountain area: Impacts and adaptations in naltar valley, western himalaya, Pakistan	Hussain, A.; Ali, S.; Begum, S.; Hussain, I.; Ali, H.	Fresenius Environmental Bulletin	2019		3	Does not mention smallholders. A detailed questionnaire survey was conducted in eastern Himalaya (Naltar Valley) to admit people's perception regarding climate change scenario, its impacts on the liveli-hoods, adaptation and coping measures.
6	Drivers of land use-land cover changes in the central rift valley of Ethiopia	Bekele, B.; Wu, W.; Yirsaw, E.	Sains Malaysiana	2019	10.17576/jsm-2019-4807-03	4	This study is aimed to assess LULCC drivers in more fragile and dynamic landscapes of the East African Rift Valley region for the period of 1986-2016.
6	Establishing the nexus between climate change adaptation strategy and smallholder farmers' food security status in South Africa: A bi-casual effect using instrumental variable approach	Samuel, O.O.; Sylvia, T.S.	Cogent Social Sciences	2019	10.1080/23311886.2019.1656402	4	Hence this study aimed to determine the synergy between climate change adaptation strategy and smallholder farmers' food security status in South Africa, in addition to exploring factors that influenced the duo.
6	Perceptions of small-scale maize farmers on climate change impacts in Hhohho, Manzini and Shiselweni regions of the Kingdom of Eswatini	Kunene, M.N.; Mthombeni, D.L.; Antwi, M.A.	Applied Ecology and Environmental Research	2019	10.15666/aeer/1704_73457356	2	Small-scale maize farmers.
2	Adaptive perception and adaptation responses to weather shocks: An adaptation deficit	Ngo, Q.-T.; Nguyen, H.-R.; Nguyen, D.-T.; Doan, N.-P.; Le, V.-T.; Thai, T.H.	Agris On-line Papers in Economics and Informatics	2019	10.7160/AOL.2019.110206	4	This study examines the influence of adaptive perception on farmers' adaptive responses to climate change induced natural shocks in the Mekong River Delta (Viet Nam) from a data set of 329 farmers in 2017.
6	A PGIS-based climate change risk assessment process for outdoor recreation and tourism dependent communities	Bitsura-Meszaros, K.; Seekamp, E.; Davenport, M.; Smith, J.W.	Sustainability (Switzerland)	2019	10.3390/su10023300	3	In this study, we engaged North Shore stakeholders in a climate change risk assessment process through an exploratory application of participatory geographic information systems (PGIS).
6	Is technical efficiency affected by farmers' preference for mitigation and adaptation actions against climate change? A case study in Northwest Mexico	Torres, M.A.O.; Kallas, Z.; Herrera, S.I.O.; Guesmi, B.	Sustainability (Switzerland)	2019	10.3390/su10023291	3	Does not mention smallholders. This study analyzed the relationship of TE with farmers' mitigation and adaptation action preferences, their risk and environmental attitudes, and their perception of climate change. Through the stochastic frontier method, TE levels were estimated for 370 farmers in Northwest Mexico in Irrigation District DR076, Valle del Carrizo.
6	Facing climate change: What drives internal migration decisions in the karst rocky regions of Southwest China	Shi, G.; Lyu, Q.; Shangguan, Z.; Jiang, T.	Sustainability (Switzerland)	2019	10.3390/su10022142	4	To amass more evidence and develop a deeper understanding of the relations between the environment and migration, this paper seeks to evaluate the importance of various drivers (economic, social, political, demographic, and environmental drivers) and determine the internal mechanism in the decision process.

6	Enabling acceptance and use of ecological intensification options through engaging smallholder farmers in semi-arid rural Limpopo and Eastern Cape, South Africa	Rusere, F.; Crespo, O.; Dicks, L.; Mkuhlani, S.; Francis, J.; Zhou, L.	Agroecology and Sustainable Food Systems	2019	10.1080/21683565.2019.1638336	4	In this study, a qualitative approach using the Unified Theory of Acceptance and Use of Technology (UTAUT) four constructs (performance, ease of use, social influence and enablers) was used to assess behavioral intention to accept and use ecological intensification options.
10	Understanding socio-ecological vulnerability to climatic change through a trajectories of change approach: A case study from an indigenous community in Panama	Li, A.; Ford, J.	Weather, Climate, and Society	2019	10.1175/WCAS-D-18-0093.1	4	This paper identifies and characterizes vulnerability to climatic change in the Ngöbe-Buglé Indigenous community of Playitas, Panama, using a ‘‘trajectories of change’’ approach.
6	Climate Variability and Farmers' Perception in Southern Ethiopia	Esayas, B.; Simane, B.; Teferi, E.; Ongoma, V.; Tefera, N.	Advances in Meteorology	2019	10.1155/2019/7341465	3	Does not mention smallholders. The study aims to analyze climate variability and farmers' perception in Southern Ethiopia.
10	Perception of the health-disease process: Meanings and values of the haliti-paresí Indians	Terças A.C.P.; da Graça B.C.; Gleriano J.S.; Do Nascimento V.F.; Hattori T.Y.; Atanaka M.; de Melo A.V.G.; de Lemos E.R.S.;	Acta Scientiarum - Health Sciences	2019	10.4025/actasciehealthsci.v41i1.40262	4	The present study aimed to know and reflect on the perception of the indigenous ethnicity Haliti-Paresí on the health-disease process.
6	Environmental perception of climate change perceived by university students on vegetarian behavioral intention	Fang, S.-C.	Journal of Baltic Science Education	2019	10.33225/jbse/19.18.227	3	The research attempted to establish a theoretical model to predict and explain the effects of health risks on vegetarian behavioral intention under climate change. The research investigated the vegetarian behavioral intention of university students derived from environmental perception, environmental attitude, and health risk perception.
2	Public health and natural hazards: new policies and preparedness initiatives developed from an Australian bushfire case study	Westcott, R.; Ronan, K.; Bambrick, H.; Taylor, M.	Australian and New Zealand Journal of Public Health	2019	10.1111/1753-6405.12897	4	Public preparedness for natural hazard events is low. With worsening severe weather events due to climate change, public health policy and practices must evolve to more effectively engage communities. This study's findings identify and suggest new strategic public health policies to shift the practice of all-hazards preparedness into routine, everyday life.
6	Agriculture and the twofold relationship between food security and climate change. Evidence from Romania	Istudor, N.; Ion, R.A.; Petrescu, I.E.; Hrebenciuc, A.	Amfiteatru Economic	2019	10.24818/EA/2019/51/285	3	Location: Romania. This piece of research is focused on the impact of agriculture on climate change, starting from the assumption that agriculture is affected by climate variability, but also it contributes to it by emitting greenhouse gases, under the restriction of less per capita land. The paper analyses the connection between agricultural emissions and agricultural output, using a simple regression model, which includes variables corresponding to agricultural production and to greenhouse gas emissions.
6	Agricultural groundwater management strategies and seasonal climate forecasting: Perceptions from Mogwadi (Dendron), Limpopo, South Africa	Fallon, A.L.; Villholth, K.G.; Conway, D.; Lankford, B.A.; Ebrahim, G.Y.	Journal of Water and Climate Change	2019	10.2166/wcc.2018.042	4	This paper explores the agricultural groundwater management system of Mogwadi (Dendron), Limpopo, South Africa - an area associated with intensive use of hard rock aquifers for irrigation - and the potential contribution of seasonal forecasts.
6	Climate, land use, and landscape change in Southern Bilad al-Sham (Northern Jordan) during the Islamic Periods	Lucke, B.	Journal of Islamic Archaeology	2019	10.1558/jia.36954	4	Common narratives of "decline" in Jordan and Syria during the Islamic periods are based on diminishing evidence for construction and maintenance of monumental architecture, and often consider man-made degradation of the environment, such as soil erosion due to mismanagement, as a key factor of reduced productivity. This contribution tackles the question of historic landscape change with a case study of the site of Abila in northern Jordan, and reviews the literature on the matter.
16	Climate risk communication of navigation safety and climate conditions over Lake Victoria basin: Exploring perceptions and knowledge of indigenous communities	Kiwanuka-Tondo, J.; Semazzi, F.; Pettiway, K.	Cogent Social Sciences	2019	10.1080/23311886.2019.1588485	3	Does not mention stakeholders. The purpose of this study is to analyze the perceptions of the stakeholders about climate change, meteorological services, causes of accidents, and cultural, social, and economic barriers that lead to lack of safety of navigation on Lake Victoria.
6	Farmers’ Risk-Based Decision Making Under Pervasive Uncertainty: Cognitive Thresholds and Hazy Hedging	Findlater, K.M.; Satterfield, T.; Kandlikar, M.	Risk Analysis	2019	10.1111/risa.13290	3	We reconceptualize farmer decision making from the ground up, using an in situ mental models approach to analyze weather and climate risk management. We assess how large-scale commercial grain farmers in South Africa (n = 90) coordinate decisions about weather, climate variability, and climate change with those around other environmental, agronomic, economic, political, and personal risks that they manage every day.
6	Understanding key-informant experiences and perceptions of the 2016 drought and wildfires in western North Carolina	Andersen, L.M.; Bonevac, A.N.; Thompson, L.K.; Dempsey, K.E.; Shay, E.D.; Sugg, M.M.	Weather, Climate, and Society	2019	10.1175/WCAS-D-18-0061.1	3	To evaluate stakeholder experiences and perceptions relating to the events in 2016, the authors conducted telephone interviews with key informants from a variety of sectors in two counties (Buncombe and Watauga) and then subjected their responses to content analysis. Study in Western North Carolina (WNC), USA.
6	Can protection motivation theory explain farmers' adaptation to climate change decision making in The Gambia?	Bagagnan, A.R.; Ouedraogo, I.; Fonta, W.M.; Sowe, M.; Wallis, A.	Climate	2019	10.3390/cli7010013	4	The present study used protection motivation theory to describe farmers' adoption of climate change adaptation measures in the Central River Region of The Gambia.
2	Awareness, access and utilization of information on climate change by farmers in Zamfara State, Nigeria	Chukwuji, C.N.; Tsafe, A.G.; Sayudi, S.; Yusuf, Z.; Zakariya, J.	Library Philosophy and Practice	2019		3	Does not mention smallholders. The population of the study consisted 1200 respondents comprising (staff of the State Agricultural Development Project, FADAMA III Project, IFAD, Animal rearers and Farmers) all in Zamfara State.
6	Maladaptation in Nordic agriculture	Neset, T.-S.; Wiréhn, L.; Klein, N.; Käyhkö, J.; Juhola, S.	Climate Risk Management	2019	10.1016/j.crm.2018.12.003	3	This study identifies unintended negative impacts of adaptation measures, drawing on a literature review and interviews with farmers and agricultural officials and experts in Sweden and Finland.
2	Emission of black carbon from rural households kitchens and assessment of lifetime excess cancer risk in villages of North India	Ravindra, K.	Environment International	2019	10.1016/j.envint.2018.11.008	4	n the current study, daily variations in black carbon (BC) or Short-Lived Climate Forcer concentrations were studied from rural household kitchens using portable aethalometer. T
2	Impact of projected climate change on workability, attainable yield, profitability and farm mechanization in Norwegian spring cereals	Kolberg, D.; Persson, T.; Mangerud, K.; Riley, H.	Soil and Tillage Research	2019	10.1016/j.still.2018.09.002	4	In cold-temperate climate with high soil water content in spring, the farmer often faces the choice between topsoil compaction during seedbed preparation and delayed sowing, both of which may reduce attainable cereal yield. The objective of this study was to explore whether future climate change with increasing precipitation would aggravate this dilemma.
6	Iranian agriculture advisors' perception and intention toward biofuel: Green way toward energy security, rural development and climate change mitigation	Yaghoubi, J.; Yazdanpanah, M.; Komendantova, N.	Renewable Energy	2019	10.1016/j.renene.2018.06.081	4	The aim of this article is to investigate Agricultural professionals' attitude and willingness towards biofuel using a random sample of professionals (n = 180) in a survey conducted in Zanjan province in Iran.
6	Spatially Representing Vulnerability to Extreme Rain Events Using Midwestern Farmers’ Objective and Perceived Attributes of Adaptive Capacity	Gardezi, M.; Arbuckle, J.G.; Jr.	Risk Analysis	2019	10.1111/risa.12943	4	Hence, it is important to understand how farmers and their farm operations may be more or less vulnerable to changes in the climate.

1	Assessing the Livelihood Vulnerability of Rural Indigenous Households to Climate Changes in Central Nepal, Himalaya	Sujakhu, N.M.; Ranjitkar, S.; He, J.; Schmidt-Vogt, D.; Su, Y.F.; Xu, J.C.	Sustainability	2019	10.3390/su11102977	4	"In this study, we attempt to explore how cultural and gender-related aspects influence livelihood vulnerability in indigenous farming mountain communities of the Nepal Himalaya in the context of climate change."
1	Assessing the awareness level of farming community regarding climate change: a survey of districts Malakand and Swat of Khyber Pakhtunkhwa Province, Pakistan	Shah, T.; Rabbi, F.; Hayat, U.; Ullah, I.; Khan, S.B.; Shah, F.	Fresenius Environmental Bulletin	2019		3	The abstract does not mention if the farmers are smallholders.
1	Gendered agrobiodiversity management and adaptation to climate change: differentiated strategies in two marginal rural areas of India	Ravera, F.; Reyes-Garcia, V.; Pascual, U.; Drucker, A.G.; Tarrason, D.; Bellon, M.R.	Agriculture And Human Values	2019	10.1007/s10460-018-09907-w	4	"It explores context-specific (i) influence of gender roles and responsibilities on on-farm agrobiodiversity management (ii) gendered expertise and knowledge related to agrobiodiversity and (iii) gendered preferences for practices and institutional arrangements for agrobiodiversity conservation linked to adaptation to climate change."
1	Weather and Climate Variability May Be Poor Proxies for Climate Change in Farmer Risk Perceptions	Findlater, K.M.; Kandlikar, M.; Satterfield, T.; Donner, S.D.	Weather Climate And Society	2019	10.1175/WCAS-D-19-0040.1	3	"Here, we use a national survey of South Africa's commercial grain farmers (n = 389)-similar to their peers in higher-income countries (e.g., North America, Europe, Australia), but without subsidies-to show that they treat weather and climate change risks quite differently."
1	Climate change adaptation among poultry farmers: evidence from Nigeria	Liverpool-Tasie, L.S.O.; Sanou, A.; Tambo, J.A.	Climatic Change	2019	10.1007/s10584-019-02574-8	4	"This study explores the level and determinants of the adoption of climate change adaptation strategies among poultry farmers in Nigeria."
1	Assessment of Agricultural Activities and Market for Local Crops under Changing Climate Conditions in Gujarat	Paragbhai, D.P.; Singh, R.	Indian Journal Of Economics And Development	2019	10.5958/2322-0430.2019.00045.3	2	Mono cropping.
1	Between science and local knowledge: improving the communication of climate change to rural agriculturists in the Bolgatanga Municipality, Ghana	Anaafo, D.	Local Environment	2019	10.1080/13549839.2018.1557126	4	"Although a lot has been done in this respect, the present study examines the extent to which misnomers associated with the calendar months and local climate events can be employed to convey the phenomenon of climate change to rural agriculturists in the Bolgatanga municipality."
1	Factors Affecting Small-Scale Fishermen's Adaptation Toward the Impacts of Climate Change: Reflections From Malaysian Fishers	Abu Samah, A.; Shaffril, H.A.M.; Hamzah, A.; Abu Samah, B.	Sage Open	2019	10.1177/2158244019864204	4	"This study aims to examine the influence of individual differences on the small-scale fishermen's climate change adaptation practices toward climate change."
1	Climate change effect on dairy in north eastern hills of India	Feroze, S.M.; Rahman, S.; Singh, K.J.; Singh, R.; Dkhar, S.E.	Indian Journal Of Animal Sciences	2019		4	"Hence, this paper assessed the effect of climate change on dairy in the north eastern Himalayan states of India."
1	Just don't call it climate change: climate-skeptic farmer adoption of climate-mitigative practices	Davidson, D.J.; Rollins, C.; Lefsrud, L.; Anders, S.; Hamann, A.	Environmental Research Letters	2019	10.1088/1748-9326/aafa30	3	Beef and grain producers in Alberta, Canada.
1	Does climate change influence people's migration decisions in Maldives?	Kelman, I.; Orlowska, J.; Upadhyay, H.; Stojanov, R.; Webersik, C.; Simonelli, A.C.; Prochazka, D.; Nemec, D.	Climatic Change	2019	10.1007/s10584-019-02376-y	4	"To contribute to this literature, this paper uses Maldives as a case study for exploring the research question: How does climate change influence or not influence people's migration decisions in Maldives?"
1	Adaptation to Climate Change among Farmers in Bulacan, Philippines	Penalba, E.H.	Journal Of Rural And Community Development	2019		3	The abstract does not mention if the farmers are smallholders.
1	Impact of climate change in Mexican peri-urban areas with risk of drought	Soto-Montes-de-Oca, G.; Alfie-Cohen, M.	Journal Of Arid Environments	2019	10.1016/j.jaridenv.2018.10.006	6	"This study analyses impacts of climate change on peri-urban communities that are at risk of drought and further demonstrates that these communities are aware of this change."
1	Building capacities of women for climate change adaptation: Insights from migrant-sending households in Nepal	Banerjee, S.; Hussain, A.; Tuladhar, S.; Mishra, A.	Climatic Change	2019	10.1007/s10584-019-02572-w	4	"This study finds that capacity-building interventions, which aimed to strengthen autonomous adaptation measures (e.g. precautionary savings and flood preparedness), also positively influenced women to approach formal institutions."
1	Improvement on Social Representation of Climate Change through a Knowledge-Based MOOC in Spanish	Ferrari, E.; Ballegeer, A.M.; Fuertes, M.A.; Herrero, P.; Delgado, L.; Corrochano, D.; Andres-Sanchez, S.; Marc Bisquert, K.; Garcia-Vinuesa, A.; Meira, P.; Martinez, F.; Ruiz, C.	Sustainability	2019	10.3390/su11226317	3	"In this paper, we extend previous investigations of how this Social Representation is formed in order to find ways to improve it through a Massive Online Open Course on the Science of Climate Change. Using a validated questionnaire, we investigated the knowledge dimension of the Social Representation of Climate Change in a group of students of a MOOC on Climate Change."
1	A graphic novel from the 4th International Symposium on the Effects of Climate Change on the World's Oceans	Link, J.S.; Kohler, B.; Griffis, R.; Brady, M.M.; Ito, S.I.; Garcon, V.; Hollowed, A.; Barange, M.; Brown, R.; Wawrzynski, W.	Ices Journal Of Marine Science	2019	10.1093/icesjms/fsy155	4	The world’s oceans are changing in response to a changing climate, these changes have significant consequences, there is much at risk, and action is needed now to increase the resilience of ocean ecosystems and the people that depend on them. That was the message from the 4th International Symposium “Effects of Climate Change on the World’s Oceans”, held from 4 to 8 June 2018 in Washington, DC. The symposium gathered □650 people from over 50 countries to discuss not only how to advance our understanding and scientific knowledge, but also how to enact solutions based on that science to address challenges facing the world’s oceans.
1	The influence of personal beliefs, friends, and family in building climate change concern among adolescents	Stevenson, K.T.; Peterson, M.N.; Bondell, H.D.	Environmental Education Research	2019	10.1080/13504622.2016.1177712	3	"We investigated the relationships between CCC, acceptance of anthropogenic global warming (AGW), perceived level of acceptance among friends and family, and frequency of discussion of the issue among 426 middle school students in North Carolina, USA, and developed a novel instrument to measure each of these constructs."
1	Determinants of adaptation measures on climate change. A case of small-scale maize farmers in the North-West Province of South Africa	Oduniyi, O.S.; Antwi, M.A.; Tekana, S.S.	Applied Ecology And Environmental Research	2019	10.15666/aeer/1705_1126111272	4	"This study examined the determinants of climate change adaptation strategies among rural farmers' households in the study area."
1	Children can foster climate change concern among their parents	Lawson, D.F.; Stevenson, K.T.; Peterson, M.N.; Carrier, S.J.; Strnad, R.L.; Seekamp, E.	Nature Climate Change	2019	10.1038/s41558-019-0463-3	3	"Here we present an experimental evaluation of an educational intervention designed to build climate change concern among parents indirectly through their middle school-aged children in North Carolina, USA."
1	Climate change and crop farming in Bangladesh: an analysis of economic impacts	Hossain, M.S.; Qian, L.; Arshad, M.; Shahid, S.; Fahad, S.; Akhter, J.	International Journal Of Climate Change Strategies And Management	2019	10.1108/IJCCSM-04-2018-0030	4	"This study aims to measure the economic impacts of climate change on crop farming in Bangladesh."

1	Evaluating climate change behaviors and concern in the family context	Lawson, D.F.; Stevenson, K.T.; Peterson, M.N.; Carrier, S.J.; Seekamp, E.; Strnad, R.	Environmental Education Research	2019	10.1080/13504622.2018.1564248	3	"We begin to fill this gap through a quantitative case study using matched household-level survey data from 182 coastal North Carolina families (n = 241 parents aged 29-77; n = 182 students aged 11-14) associated with 15 middle school science teachers."
1	Integrated vulnerability assessment of ecotourism to climate change in Dana Biosphere Reserve, Jordan	Jamaliah, M.M.; Powell, R.B.	Current Issues In Tourism	2019	10.1080/13683500.2017.1401982	4	"We conducted qualitative semi-structured interviews with key informants in DBR to assess climate change-related threats, their influence on natural resources, local communities and ecotourism's activities; and adaptation practices." DBR= Dana Biosphere Reserve
1	Missed opportunities: the absence of climate change in media coverage of forest fire events in Alberta	Davidson, D.J.; Fisher, A.; Blue, G.	Climatic Change	2019	10.1007/s10584-019-02378-w	4	"In one of few media analyses of the inclusion of climate change discussion in coverage of extreme events that are linked to climate change, we provide the results of an analysis of media coverage of climate-related threats to forests, including in particular forest fires in the Province of Alberta."
1	Now I See: Photovisualization to Support Agricultural Climate Adaptation	Schattman, R.E.; Hurley, S.; Caswell, M.	Society & Natural Resources	2019	10.1080/08941920.2018.1530819	4	"This research uses a focus group approach to explore (1) whether photovisualizations can aid in decision-making about climate change adaptation, and (2) what characteristics of photovisualizations are most effective at conveying spatial aspects of adaptation practices."
1	Farmers' Perceptions of Climate Change in Context: Toward a Political Economy of Relevance	Houser, M.; Gunderson, R.; Stuart, D.	Sociologia Ruralis	2019	10.1111/soru.12268	2	row-crop farmers
1	Educational attainment predicts negative perceptions women have of their own climate change knowledge	Selm, K.R.; Peterson, M.N.; Hess, G.R.; Beck, S.M.; McHale, M.R.	Plos One	2019	10.1371/journal.pone.0210149	3	"We explored this possibility with a case study in Raleigh, North Carolina in 2015 (n = 200)."
1	Climate change perceptions and their individual-level determinants: A cross-European analysis	Poortinga, W.; Whitmarsh, L.; Steg, L.; Bohm, G.; Fisher, S.	Global Environmental Change-Human And Policy Dimensions	2019	10.1016/j.gloenvcha.2019.01.007	3	Cross-European analysis
1	Generation gaps in US public opinion on renewable energy and climate change	Hamilton, L.C.; Hartter, J.; Bell, E.	Plos One	2019	10.1371/journal.pone.0217608	4	Approaches renewable energy .
1	Climate change resiliency choices of small-scale farmers in Cameroon: determinants and policy implications	Awazi, N.P.; Tchamba, M.N.; Avana, T.M.L.	Journal Of Environmental Management	2019	10.1016/j.jenvman.2019.109560	4	"It is within this framework that this study sought to examine the specific resiliency choices of small-scale farmers faced with climate variability and change in Cameroon, and the plausible policy implications."
1	Assessing Agricultural Livelihood Vulnerability to Climate Change in Coastal Bangladesh	Hoque, M.Z.; Cui, S.H.; Xu, L.L.; Islam, I.; Tang, J.X.; Ding, S.P.	International Journal Of Environmental Research And Public Health	2019	10.3390/ijerph16224552	4	"Here, we develop an agricultural livelihood vulnerability index (ALVI) and an integrated approach, allowing for (i) mapping out the hot spots of vulnerability distribution; (ii) identifying key factors of spatially heterogeneous vulnerability; and (iii) supporting intervention planning for adaptation."
1	Culture, climate change and mobility decisions in Pacific Small Island Developing States	Oakes, R.	Population And Environment	2019	10.1007/s11111-019-00321-w	4	"This paper adopts a cultural ecology framing to gain a greater understanding of these contested local discourses on climate change and human mobility in Kiribati, Tuvalu and Nauru through the use of the Q method."
1	Testing the Influence of Recent Weather on Perceptions of Personal Experience with Climate Change and Extreme Weather in New York State	Fownes, J.R.; Allred, S.B.	Weather Climate And Society	2019	10.1175/WCAS-D-17-0107.1	3	"This study assesses how New York State adults' overall perceptions of their personal experiences with the effects of climate change and extreme weather (surveyed in early 2014) are related to recent weather conditions."
1	Extension interventions in coping of farmers against effect of climate change in dairy farming	Ponnusamy, K.; Chakravarty, R.; Singh, S.	Indian Journal Of Dairy Science	2019		2	This article focuses in climate sensitive issues which affect the productivity of dairy farming, as well as National Innovations in Climate Resilient Agriculture
1	Adaptations to extreme storm events by conservation organizations	Wardropper, C.B.; Rissman, A.R.	Climatic Change	2019	10.1007/s10584-018-2342-8	3	"This study uses a survey of Soil and Water Conservation District staff (n=260) in the United States Upper Midwest to better understand adaptation planning and implementation and the factors influencing adaptations by public organizations. In contrast to a typical planning-implementation gap finding, our respondents report a greater emphasis on some kinds of adaptation actions over planning."
1	Comparing adaptation ability towards climate change impacts between the youth and the older fishermen	Abu Samah, A.; Shaffril, H.A.M.; Fadzil, M.F.	Science Of The Total Environment	2019	10.1016/j.scitotenv.2019.05.089	4	"Accordingly, this has driven the present study to achieve its main objective which is to compare the adaptation ability between youth and older fishermen"
1	Anger and Sadness: Gendered Emotional Responses to Climate Threats in Four Island Nations	du Bray, M.; Wutich, A.; Larson, K.L.; White, D.D.; Brewis, A.	Cross-Cultural Research	2019	10.1177/1069397118759252	3	"Using a cross-cultural analysis of qualitative data from four island countries (Fiji, Cyprus, New Zealand, and the United Kingdom; total N = 272), this article explores how different sensitivities to climate change may produce differentiated emotional responses among men versus women across these four sites."
1	Modeling the climate suitability of tea [Camellia sinensis(L.) O. Kuntze] in Sri Lanka in response to current and future climate change scenarios	Jayasinghe, S.L.; Kumar, L.	Agricultural And Forest Meteorology	2019	10.1016/j.agrformet.2019.03.025	4	"This study aimed to model the climate suitability of tea in Sri Lanka in response to the current and future climate change scenarios using the correlative habitat suitability model MaxEnt."
1	Who cares about ocean acidification in the Plasticene?	Tiller, R.; Arenas, F.; Galdies, C.; Leitao, F.; Malej, A.; Romera, B.M.; Solidoro, C.; Stojanov, R.; Turk, V.; Guerra, R.	Ocean & Coastal Management	2019	10.1016/j.ocecoaman.2019.03.020	4	"In this article, we argue that the effective global environmental governance of ocean acidification, though critical to address, mitigate against and adapt to, is hindered by the both this lack of perception of urgency in the general public, fueled by a lack of media coverage, as well as a fight-or-flight response resulting from fear."
1	Vulnerability assessment of climate change impacts on a Globally Important Agricultural Heritage System (GIAHS) in the Philippines: the case of Batad Rice Terraces, Banaue, Ifugao, Philippines	Ducusin, R.J.C.; Espaldon, M.V.O.; Rebancos, C.M.; De Guzman, L.E.P.	Climatic Change	2019	10.1007/s10584-019-02397-7	4	This study aimed to determine the level of vulnerability of Batad Rice Terraces to climate change impacts. To do this, the study examined the vulnerability as a function of exposure (E), sensitivity (S), and adaptive capacity (AC)."
1	Resettlement as climate change adaptation: what can be learned from state-led relocation in rural Africa and Asia?	Arnall, A.	Climate And Development	2019	10.1080/17565529.2018.1442799	8	"It draws on a review of planned displacement and resettlement in eight countries, and six months' experience researching a relocation programme in central Mozambique, to make three arguments: first, there is a need to uncover long-standing governmental perceptions of rural populations and the ways in which these affect state-led responses to climate shocks and stresses; second, it is necessary to develop a more sophisticated understanding of human choice, volition and self-determination during resettlement as adaptation; and third, greater attention should be paid to how development narratives are generated, transmitted and internalized during climate-induced relocations."

1	Risk Communication on Floodings: Insights Into the Risk Awareness of Migrants in Rural Communities in Austria	Weber, K.; Wernhart, S.; Stickler, T.; Fuchs, B.; Balas, M.; Hubl, J.; Damyanovic, D	Mountain Research And Development	2019	10.1659/MRD-JOURNAL-D-18-00060.1	4	"This article aims to contribute to a better understanding of efficient communication as well as targetgroup-oriented communication channels and contents that foster risk awareness and private adaptation capacity among migrants in rural Austria."
1	Drivers of changing urban flood risk: A framework for action	Berndtsson, R.; Becker, P.; Persson, A.; Aspegren, H.; Haghighatafshar, S.; Jonsson, K.; Larsson, R.; Mobini, S.; Mottaghi, M.; Nilsson, J.; Nordstrom, J.; Pilesjo, P.; Scholz, M.; Sternudd, C.; Sorensen, J.; Tussupova, K.	Journal Of Environmental Management	2019	10.1016/j.jenvman.2019.03.094	6	"This study focuses on drivers for changing urban flood risk."
1	Exploring potential climate-related entrepreneurship opportunities and challenges for rural Nigerian women	Akinbami, C.A.O.; Olawoye, J.E.; Adesina, F.A.; Nelson, V.	Journal Of Global Entrepreneurship Research	2019	10.1186/s40497-018-0141-3	2	"This study examines the awareness of and impacts of climatic changes as perceived by women in South West Nigeria in diverse vegetation zones. It elicits the challenges facing women and which constrain their entrepreneurial activities."
1	An affective explanation of climate beliefs: evidence from dairy farmers in New Zealand	Tisch, D.; Hamilton-Hart, N.	Australasian Journal Of Regional Studies	2019		2	"We draw from two areas of scholarship to provide an explanation of how farmers in a particular industry context form their beliefs about climate change."
1	Local Knowledge, Uses, and Factors Determining the Use of Strychnos spinosa Organs in Benin (West Africa)	Avakoudjo, H.G.G.; Hounkpevi, A.; Idohou, R.; Kone, M.W.; Assogbadjo, A.E.	Economic Botany	2019	10.1007/s12231-019-09481-0	4	"The objectives of this study were to (i) examine the various indigenous uses of Strychnos spinosa, (ii) assess local perception of the major threats to Strychnos spinosa, and (iii) identify the conservation strategies adopted by local communities to ensure its sustainable use in Benin."
1	Factors Affecting the Intention of the Rice Farmers to Adopt the Integrated Cash Waqf Environmental Protection Model: An Empirical Study in Kedah Malaysia	Afroz, R.; Muhibbullah, M.; Morshed, M.N.	Journal Of Asian Finance Economics And Business	2019	10.13106/jafeb.2019.vol6.no4.189	4	"The objectives of this study are to propose the Integrated Waqf Environmental Protection Model (IWEP) and investigate the farmers' intention to adopt it."
1	Achieving the Sustainable Development Goals: A Mixed Methods Study of Health-Related Water, Sanitation, and Hygiene (WASH) for Indigenous Shawi in the Peruvian Amazon	Torres-Slimming, P.A.; Wright, C.; Carcamo, C.P.; Garcia, P.J.; Harper, S.L.	International Journal Of Environmental Research And Public Health	2019	10.3390/ijerph16132429	4	"this study described the knowledge, practices, and perceptions of WASH held by residents of two Indigenous Shawi communities in the Peruvian Amazon." WASH= Water, sanitation and hygiene
1	Human mobility intentions in response to heat in urban South East Asia	Zander, K.K.; Richerzhagen, C.; Garnett, S.T.	Global Environmental Change-Human And Policy Dimensions	2019	10.1016/j.gloenvcha.2019.03.004	6	"Using Protection Motivation Theory (PMT), we investigate how hot temperatures, manifested as heat stress, is affecting the intentions of moving among the urban population in three Asian countries (Indonesia, Malaysia, Philippines)."
1	Does livelihood vunerability index justify the socio-economic status of mountainous community? A case study of post-earthquake ecological adaptation of Balakot Population	Shahzad, L.; Tahir, A.; Sharif, F.; Hayyat, M.U.; Ghani, N.; Farhan, M.; Dogar, S.S.	Applied Ecology And Environmental Research	2019	10.15666/aeer/1703_66056624	4	"The current study has assessed livelihood vulnerability due to climatic variability of natural resource dependent mountainous communities."
1	Determinants in the adoption of climate change adaptation strategies: evidence from rainfed-dependent smallholder farmers in north-central Ethiopia (Woleka sub-basin)	Asfaw, A.; Simane, B.; Bantider, A.; Hassen, A.	Environment Development And Sustainability	2019	10.1007/s10668-018-0150-y	4	"A cross-sectional survey research design was employed to collect data from 384 randomly selected smallholder farmers to identify adaptation measures being undertaken and to estimate the prominent determinants in the adoption of adaptations in drought-prone areas of north-central Ethiopia."
1	The perception of climate-related coastal risks and environmental changes on the Rangiroa and Tikehau atolls, French Polynesia: The role of sensitive and intellectual drivers	Goeldner-Gianella, L.; Grancher, D.; Magnan, A.K.; de Belizal, E.; Duvat, V.K.E.	Ocean & Coastal Management	2019	10.1016/j.ocecoaman.2019.01.018	3	Does not mention smallholders.
1	Climate change adaptation actions by fish farmers: evidence from the Niger Delta Region of Nigeria	Onyeneke, R.U.; Igberi, C.O.; Aligbe, J.O.; Iruo, F.A.; Amadi, M.U.; Iheanacho, S.C.; Osuji, E.E.; Munonye, J.; Uwadoka, C.	Australian Journal Of Agricultural And Resource Economics	2019	10.1111/1467-8489.12359	4	"This paper examined climate change adaptation strategies in fish farming and the effect of such methods on the profit of fish farmers in the Niger Delta region of Nigeria, Africa's most populous country."
1	Overtourism, optimisation, and destination performance indicators: a case study of activities in Fjord Norway	Oklevik, O.; Gossling, S.; Hall, C.M.; Jacobsen, J.K.S.; Grotte, I.P.; McCabe, S.	Journal Of Sustainable Tourism	2019	10.1080/09669582.2018.1533020	4	"Drawing on a survey of international tourists (n = 5,249) in south-western Norway, this article discusses whether 'activities', i.e. the development of local, small-scale and ideally more sustainable experiences, can contribute to economic growth without necessarily increasing numbers of arrivals."
1	SWOT analysis for the development of photovoltaic solar power in Africa in comparison with China	Lei, Y.; Lu, X.; Shi, M.; Wang, L.; Lv, H.Y.; Chen, S.R.; Hu, C.Y.; Yu, Q.H.; da Silveira, S.D.H.	Environmental Impact Assessment Review	2019	10.1016/j.eiar.2019.04.005	4	"The analysis particularly emphasizes on a new opportunity for African countries to develop their solar power resource through mutually beneficial cooperation between Africa and China within the framework of the Belt and Road Initiative (BRI)."
1	Socio-ecological dimensions of Andean pastoral landscape change: bridging traditional ecological knowledge and satellite image analysis in Sajama National Park, Bolivia	Yager, K.; Valdivia, C.; Slayback, D.; Jimenez, E.; Meneses, R.I.; Palabral, A.; Bracho, M.; Romero, D.; Hubbard, A.; Pacheco, P.; Calle, A.; Alberto, H.; Yana, O.; Ulloa, D.; Zeballos, G.; Romero, A.	Regional Environmental Change	2019	10.1007/s10113-019-01466-y	4	"Assessing land cover change using satellite images, vegetation survey, and local knowledge (i.e., traditional ecological knowledge) reveals the multi-faceted socio-ecological dimensions of bofedal change in Sajama National Park (PNS), Bolivia. Here, we present results from focus groups held in 2016 and 2017 to learn about the local knowledge of bofedales in five Aymara communities in PNS."
1	Prepared for change? An assessment of the current state of knowledge to support climate adaptation for Australian fisheries	Fogarty, H.E.; Cvitanovic, C.; Hobday, A.J.; Pecl, G.T.	Reviews In Fish Biology And Fisheries	2019	10.1007/s11160-019-09579-7	8	"Here, we examined the extent of primary scientific literature that is currently available to inform climate adaption initiatives for Australian fisheries."

1	Is global warming affecting the weather?' Evidence for increased attribution beliefs among coastal versus inland US residents	Cutler, M.J.; Marlon, J.; Howe, P.; Leiserowitz, A.	Environmental Sociology	2019	10.1080/23251042.2019.1690725	3	"This study matches geo-located responses to a nationally representative survey of US residents with climate extremes data in order to investigate the social and physical factors shaping public views about the links between global warming and extreme weather."
1	Snow leopard stewardship in mitigating human-wildlife conflict in Hemis National Park, Ladakh, India	Maheshwari, A.; Sathyakumar, S.	Human Dimensions Of Wildlife	2019	10.1080/10871209.2019.1610815	4	Approaches human-wildlife conflict.
1	Perceived effects of drought on household food security in South-western Uganda: Coping responses and determinants	Twongyirwe, R.; Mfitumukiza, D.; Barasa, B.; Naggayi, B.R.; Odongo, H.; Nyakato, V.; Mutoni, G.	Weather And Climate Extremes	2019	10.1016/j.wace.2019.100201	4	"In this study, we: 1) characterise relationships between perceptions of drought and food insecurity and corresponding household coping responses, 2) compare livelihood characteristics of farmers that perceived food insecurity as a problem and those who did not, and 3) investigate how household-level characteristics correspond to household coping strategies."
1	Enhancing Local Adaptive Capacities of Selected Upland Farming Communities in Southeast Asia: Lessons and Experiences	Landicho, L.D.; Wulandari, C.; Huy, B.; Visco, R.G.; Carandang, W.M.; Cabahug, R.E.D.	Asian Journal Of Agriculture And Development	2019		4	"This article highlights the experiences and lessons generated by the project collaborators in enhancing the adaptive capacities of selected upland farming communities in Southeast Asia."
1	Taking stock of the status of implementation of the Voluntary Guidelines for Securing Sustainable Small-scale Fisheries: A country-level assessment framework	Courtney, C.A.; Pomeroy, R.; Brooks, S.H.	Marine Policy	2019	10.1016/j.marpol.2018.12.005	4	This article proposes a country-level framework to assess governments' profress in meeting the guideliens of the FAO Voluntary Guidelines on Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication.
7	Mapping indigenous climate resilience practices in animal disease management and feed storage protection in Himachal himalayas	Rana, R.S.; Kaundal, M.; Katoch, A.; Singh, S.; Sood, K.	Indian Journal Of Animal Sciences	2019		4	"The present study focused on validation of indigenous climate resilience practices in animal diseases and feed storage management based on 1,605 farmers' perceptions in eight districts in north-western Himalaya."
1	Incorporating social dimensions in hydrological and water quality modeling to evaluate the effectiveness of agricultural beneficial management practices in a Prairie River Basin	Bradford, L.; Thapa, A.; Duffy, A.; Hassanzadeh, E.; Strickert, G.; Noble, B.; Lindenschmidt, K.E.	Environmental Science And Pollution Research	2019	10.1007/s11356-019-06325-1	4	"We discuss pilot testing and engagement workshops for building and testing a systems dynamics model of the Qu'Appelle Valley to gather insights from local farmers and understand their perceptions of Beneficial Management Practices (BMPs)."
1	Long-term risk governance: when do societies act before crisis?	Shwom, R.; Kopp, R.E.	Journal Of Risk Research	2019	10.1080/13669877.2018.1476900	3	"In this article, we ask the question: Under what conditions do societies act to address a long-term risk before crisis? We draw from the literature in economics, psychology, sociology and political science to provide a range of potential factors that would contribute to addressing long-term risks."
1	Attitudes towards biodiversity conservation and carbon substitution in forestry: a study of stakeholders in Sweden	Eriksson, L.; Klapwijk, M.J.	Forestry	2019	10.1093/forestry/cpz003	4	"This study examined relations between environmental problem awareness, forest beliefs and environmental management attitudes (biodiversity conservation and carbon substitution) among stakeholders in Sweden, and explored the effect of a local biodiversity versus global climate change frame on attitudes."
1	Evaluation of Carbon Emission Reduction via GCIP Projects: Creating a Better Future for Pakistan	Khalil, A.; Javed, A.; Bashir, H.	Earth Systems And Environment	2019	10.1007/s41748-019-00089-x	4	"The present study focused on the evaluation of carbon emission reduction level by replacing Global Cleantech Innovation Program (GCIP) projects with conventional practices and to assess the difference between these zero or less emission technologies and conventional practices."
1	A New Financing Model for Carbon Emission Reduction Projects: The Use of Carbon Emission Reduction Purchase Agreements (ERPA) in the Private Pension System	Sen, G.; Celik, M.Y.; Ulusoy, T.	Alinteri Journal Of Agriculture Sciences	2019	10.28955/alinterizbd.664754	4	"The aim of this study is to develop a new mechanism to create a source of financing for afforestation investments."
1	We know our Terrain': indigenous knowledge preferred to scientific systems of weather forecasting in the Delta State of Nigeria	Ebhuoma, E.E.; Simatele, D.M.	Climate And Development	2019	10.1080/17565529.2017.1374239	4	"Drawing on fieldwork conducted in the Delta State of Nigeria, this paper discusses the factors that contribute towards farmer's willingness to adhere to IKS." IKS= Indigenous knowledge systems
1	Geoengineering and geographers: Rewriting the Earth in what image?	Bellamy, R.; Palmer, J.	Area	2019	10.1111/area.12495	4	"In this paper we contend that geographical ideas about space, scale, power and geopolitics must urgently be brought to bear on ongoing efforts to experiment with geoengineering, and to deliberate its future role in responses to climate change."
1	Widespread Crown Defoliation After a Drought and Heat Wave in the Forests of Tuscany (Central Italy) and Their Recovery-A Case Study From Summer 2017	Pollastrini, M.; Puletti, N.; Selvi, F.; Iacopetti, G.; Bussotti, F.	Frontiers In Forests And Global Change	2019	10.3389/ffgc.2019.00074	4	"The aim of this case report were to describe the impact of this event on representative forest communities in central Italy, to analyze the different responses of deciduous and evergreen tree and shrub species in contrasting environmental conditions and to assess their subsequent capacity of recovery or, if not, mortality."
1	Analysis of rural people's attitude towards the management of tribal forests in South Africa	Ofoegbu, C.; Chirwa, P.W.	Journal Of Sustainable Forestry	2019	10.1080/10549811.2018.1554495	4	"This study examines the attitudes of rural people in South Africa towards the management of tribal forests."
1	Keep quiet on climate: Assessing public response to seven renewable energy frames in the Western United States	Hazboun, S.O.; Briscoe, M.; Givens, J.; Krannich, R.	Energy Research & Social Science	2019	10.1016/j.erss.2019.101243	4	"Using a 2016 mail survey of individuals living in five states in the Rocky Mountain region of the U.S., we examine predictors of public approval of renewable energy usage, approval of a 20% renewable portfolio standard policy, and agreement with seven frames for renewable energy, of which four referenced the environment and three did not."
1	What is out there? a typology of land restoration projects in Latin America and the Caribbean	Coppus, R.; Romijn, J.E.; Mendez-Toribio, M.; Murcia, C.; Thomas, E.; Guariguata, M.R.; Herold, M.; Verchot, L.	Environmental Research Communications	2019	10.1088/2515-7620/ab2102	4	"We aimed to develop a restoration typology as a function of the geographical and socio-economical setting, planning, timeframe, finances, implementation, monitoring and potential impact, which will help to discern broad patterns and identify gaps in project implementation in LAC." LAC= Latin American and Caribeean
1	Extreme floods and river values: A social-ecological perspective	Parsons, M.	River Research And Applications	2019	10.1002/rra.3355	3	Does not mention smallholders, small-scale population . "A survey of the public perceptions of extreme floods revealed that participants generally understood the ecological values of extreme floods through concepts of naturalness, climate change, and knowledge production."
1	A sense of sustainability? - How sensory consumer science can contribute to sustainable development of the food sector	Aschemann-Witzel, J.; Ares, G.; Thogersen, J.; Monteleone, E.	Trends In Food Science & Technology	2019	10.1016/j.tifs.2019.02.021	4	"This commentary examines what is required of the agricultural and food sector in order to sustainably transform, and outlines the current research streams in sensory consumer science from a sustain ability perspective."
1	On-Site Water and Wind Erosion Experiments Reveal Relative Impact on Total Soil Erosion	Marzen, M.; Iserloh, T.; Fister, W.; Seeger, M.; Rodrigo-Comino, J.; Ries, J.B.	Geosciences	2019	10.3390/geosciences9110478	4	"The relative impact of water and wind on total erosion was investigated by means of an experimental-empirical study."

1	Governance and stakeholder perspectives of managed re-alignment: adapting to sea level rise in the Inner Forth estuary, Scotland	Liski, A.H.; Ambros, P.; Metzger, M.J.; Nicholas, K.A.; Wilson, A.M.W.; Krause, T.	Regional Environmental Change	2019	10.1007/s10113-019-01505-8	4	"We interviewed 16 local organisations, landowners and farmers and held workshops with 109 citizens living the Inner Forth estuary in eastern Scotland, to examine how managed realignment is supported by stakeholder attitudes and their engagement."
1	A Waterfront View of Coastal Hazards: Contextualizing Relationships among Geographic Exposure, Shoreline Type, and Hazard Concerns among Coastal Residents	Scyphers, S.B.; Beck, M.; Furman, K.L.; Haner, J.; Josephs, L.I.; Lynskey, R.; Keeler, A.G.; Landry, C.E.; Powers, S.P.; Webb, B.M.; Grabowski, J.H.	Sustainability	2019	10.3390/su11236687	4	"To explore potential relationships among geographic exposure (waterfront vs. inland), shoreline condition (armored vs. natural), and hazard concerns, we surveyed 583 waterfront and inland residents in the northern Gulf of Mexico."
1	Australian Consumers' Response to Insects as Food	Sogari, G.; Bogueva, D.; Marinova, D.	Agriculture-Basel	2019	10.3390/agriculture9050108	4	"The aim of this work is to explore attitudes towards edible insects of younger Australians (Millennials and Generation Z) with data collection carried out in Sydney, Australia."
1	Human adaptation to invasive species: A conceptual framework based on a case study metasynthesis	Howard, P.L.	Ambio	2019	10.1007/s13280-019-01297-5	4	"To address this, a framework conceptualising autochthonous human adaptation to invasions was developed based on the Human Adaptation to Biodiversity Change framework and a case study metasynthesis."
1	Intra-seasonal risk of agriculturally-relevant weather extremes in West African Sudan Savanna	Boansi, D.; Tambo, J.A.; Muller, M.	Theoretical And Applied Climatology	2019	10.1007/s00704-018-2384-x	3	Does not mention smallholders. Using household survey data and historical daily climate data for 29 communities across Upper East Ghana and Southwest Burkina Faso, we document climatic conditions deemed major threat to farming in the West African Sudan Savanna and assess risks posed by such conditions over the period 1997-2014.
1	Mobility, food and housing: responsibility, individual consumption and demand-side policies in European deep decarbonisation pathways	Moberg, K.R.; Aall, C.; Dorner, F.; Reimerson, E.; Ceron, J.P.; Skold, B.; Sovacool, B.K.; Piana, V.	Energy Efficiency	2019	10.1007/s12053-018-9708-7	4	"It draws on original data gathered in the project HOusehold Preferences for reducing greenhouse gas Emissions in four European High Income Countries' (HOPE) to analyse policies targeting and affecting direct and indirect GHG emissions in three household consumption categories (mobility, housing and food) in four countries (France, Germany, Norway and Sweden) and four medium-sized cities."
1	Assessing impact of varied social and ecological conditions on inherent vulnerability of Himalayan agriculture communities	Chauhan, N.; Shukla, R.; Joshi, P.K.	Human And Ecological Risk Assessment	2019	10.1080/10807039.2019.1675494	4	"This study aims to assess impact of social and ecological dimensions on vulnerability of agricultural communities in different biogeographical zones of Himalaya."
1	The future of mountain agriculture amidst continual farm-exit, livelihood diversification and outmigration in the Central Himalayan villages	Naudiyal, N.; Arunachalam, K.; Kumar, U.	Journal Of Mountain Science	2019	10.1007/s11629-018-5160-6	4	"This study aims at assessing methods of livelihood diversification and factors influencing farm-exit in Central Himalayan villages of Uttarakhand, India, while trying to understand local perspectives on challenges in pursuing agriculture as a viable livelihood option."
1	An environmental (pre)history of European fishing: past and future archaeological contributions to sustainable fisheries	Barrett, J.H.	Journal Of Fish Biology	2019	10.1111/jfb.13929	4	"This paper explores the past and potential contribution of archaeology to marine historical ecology."
1	Impact assessment of land use changes using local knowledge for the provision of ecosystem services in northern Ghana, West Africa	Koo, H.; Kleemann, J.; Furst, C.	Ecological Indicators	2019	10.1016/j.ecolind.2019.04.002	4	"This study presents a stakeholder-based modeling approach to assess the potential impact of land use patterns and land use changes on ecosystem services in two districts of northern Ghana."
1	Design options, implementation issues and evaluating success of ecologiccally engineered shorelines	Morris, R.L.; Heery, E.C.; Loke, L.H.L.; Lau, E.; Strain, E.M.A.; Airoldi, L.; Alexander, K.A.; Bishop, M.J.; Coleman, R.A.; Cordell, J.R.; Dong, Y.W.; Firth, L.B.; Hawkins, S.J.; Heath, T.; Kokora, M.; Lee, S.Y.; Miller, J.K.; Perkol-Finkel, S.; Rella, A.; Steinberg, P.D.; Takeuchi, I.; Thompson, R.C.; Todd, P.A.; Toft, J.D.; Leung, K.M.Y.	Oceanography And Marine Biology: An Annual Review, Vol 57	2019		4	"In this review, we present an overview of current ecoengineered shoreline design options, the drivers and constraints that influence implementation and factors to consider when evaluating the success of such ecologically engineered shorelines."
1	The Challenges of the Forestry Sector Communication Based on an Analysis of Research Studies in the Czech Republic	Riedl, M.; Jarsky, V.; Palatova, P.; Sloup, R.	Forests	2019	10.3390/f10110935	4	"This article deals with the results of current research studies and formulates conclusions in relation to this communication strategy." Communication of the challenges of climate change
1	Vulnerability of rural household livelihood to climate variability and adaptive strategies in landslide-threatened western mountainous regions of the Three Gorges Reservoir Area, China	Peng, L.; Xu, D.D.; Wang, X.X.	Climate And Development	2019	10.1080/17565529.2018.1445613	4	"Using household data from the Three Gorges Reservoir Area, this study accounts for community adaptive capacity and constructs an evaluation index system."
1	Assessment and prediction of spatial patterns of human-elephant conflicts in changing land cover scenarios of a human-dominated landscape in North Bengal	Naha, D.; Sathyakumar, S.; Dash, S.; Chettri, A.; Rawat, G.S.	Plos One	2019	10.1371/journal.pone.0210580	4	"We analyzed data maintained by the wildlife department on human deaths and injuries caused by elephant attacks between 2006-2016 to understand spatial and temporal patterns of human-elephant conflict, frequency and distribution."
1	Change as a Double-edged Sword: Ecological Farmers' Stressors and Responses to Changes In Farming in Grey County, Ontario	Bondy, M.; Cole, D.C.	Journal Of Rural And Community Development	2019		4	"In this qualitative study, based on 16 in-depth interviews with small-scale farmers in Grey County of Southwestern Ontario, Canada, we explored farmers' perceptions of changing farming practices and their implications for their health as well as ways of responding and adapting to these changes."
1	Participatory coastal management through elicitation of ecosystem service preferences and modelling driven by coastal squeeze	Martinez-Lopez, J.; Teixeira, H.; Morgado, M.; Almagro, M.; Sousa, A.I.; Villa, F.; Balbi, S.; Genua-Olmedo, A.; Nogueira, A.J.A.; Lillebo, A.I.	Science Of The Total Environment	2019	10.1016/j.scitotenv.2018.10.309	4	"The aim of this study is to apply an ecosystem based-management approach to mitigate the impacts on biodiversity resulting from the management plan."

1	Mediterranean jellyfish as novel food: effects of thermal processing on antioxidant, phenolic, and protein contents	Leone, A.; Lecci, R.M.; Milisenda, G.; Piraino, S.	European Food Research And Technology	2019	10.1007/s00217-019-03248-6	4	"We show thermal treatment (100 degrees C, 10min) can be used as a first stabilization step on three common Mediterranean jellyfish, the scyphomedusae Aurelia coerulea, Cotylorhiza tuberculata, Rhizostoma pulmo, differently affecting protein and phenolic contents of their main body parts."
1	Urban Gardening in Germany: Cultivating a Sustainable Lifestyle for the Societal Transition to a Bioeconomy	Winkler, B.; Maier, A.; Lewandowski, I.	Sustainability	2019	10.3390/su11030801	4	"This study investigated the motivations for urban gardening in Germany, based on an extensive review of 657 urban gardening project websites."
1	Reflecting on Behavioral Spillover in Context: How Do Behavioral Motivations and Awareness Catalyze Other Environmentally Responsible Actions in Brazil, China, and Denmark?	Nash, N.; Whitmarsh, L.; Capstick, S.; Thogersen, J.; Gouveia, V.; Araujo, R.D.R.; Herder, M.K.; Wang, X.; Liu, Y.B.	Frontiers In Psychology	2019	10.3389/fpsyg.2019.00788	4	"This paper employs a qualitative, cross-cultural approach to explore people's subjective self-reflections on their experiences of pro-environmental behavioral spillover in three countries; Brazil, China, and Denmark."
1	Landscape Fragmentation, Ecosystem Services, and Local Knowledge in the Baroro River Watershed, Northern Philippines	Ramirez, M.A.M.; Pulhin, J.M.; Garcia, J.E.; Tapia, M.A.; Pulhin, F.B.; Cruz, R.V.O.; De Luna, C.C.; Inoue, M.	Resources-Basel	2019	10.3390/resources8040164	4	"This paper aims to establish associations between watershed landscape fragmentation and ES by integrating science (satellite imageries and fragmentation analyses) and local geographic knowledge (key informant interviews and focus group discussions) at different time periods."
1	Of bugs and men: How forest pests and their management strategies are perceived by visitors of an urban forest	Gutsch, M.; Larondelle, N.; Haase, D.	Urban Forestry & Urban Greening	2019	10.1016/j.ufug.2019.03.003	4	"In this paper, a survey with 554 complete responses, conducted in the forest district of the Teufelssee in south-east Berlin, Germany, sheds first light on visitors' perceptions of biological pests and their management."
1	Of Climate and Weather: Examining Canadian Farm and Livestock Organization Discourses from 2010 to 2015	Tourangeau, W.; Sherren, K.; Kent, C.; MacDonald, B.H.	Weather Climate And Society	2019	10.1175/WCAS-D-18-0028.1	2	"Of particular interest are commodities related to pasture-based grazing, which is underrepresented in the climate adaptation literature."
1	Are the pens working for justice? News media coverage of renewable energy involving Indigenous Peoples in Canada	Walker, C.; Alexander, A.; Doucette, M.B.; Lewis, D.; Neufeld, H.T.; Martin, D.; Masuda, J.; Stefanelli, R.; Castleden, H.	Energy Research & Social Science	2019	10.1016/j.erss.2019.101230	4	"Using Etuaptmumk (Two-Eyed Seeing) and energy justice frameworks, we are interested in the ways Indigenous Peoples are being written about and perceived among the Canadian public."
1	Designing collaborative governance: Insights from the drought contingency planning process for the lower Colorado River basin	Sullivan, A.; White, D.D.; Hanemann, M.	Environmental Science & Policy	2019	10.1016/j.envsci.2018.10.011	4	"This research integrates concepts from institutional, adaptive governance, and bargaining theories to analyze barriers and facilitators to collaborative governance in the drought contingency plan (DCP) process for the lower Colorado River basin from an Arizona stakeholder's perspective."
1	Measuring political will: An index of commitment to disaster risk reduction	Lassa, J.A.; Surjan, A.; Caballero-Anthony, M.; Fisher, R.	International Journal Of Disaster Risk Reduction	2019	10.1016/j.ijdrr.2018.11.006	4	"With this in mind, this paper proposes an index aimed at measuring countries' commitment to reduce risks from disasters and changing climate."
1	Engaging multiple stakeholders to reconcile climate, conservation and development objectives in tropical landscapes	Reed, J.; Barlow, J.; Carmenta, R.; van Vianen, J.; Sunderland, T.	Biological Conservation	2019	10.1016/j.biocon.2019.108229	4	"Here we draw on consultation workshops, advances in the literature, and our collective experience to identify key constraints and opportunities to better engage stakeholders in tropical landscape decision-making processes. Specifically, we ask: (1) what are the key challenges related to effectively engaging multiple stakeholders in integrated landscape approaches and (2) what lessons can be learned from practitioners, and how can these lessons serve as opportunities to avoid duplicating future research efforts or repeating past perceptions of underperformance."
1	Private Actions and Preferences for Coordinated Groundwater Conservation in Colorado's Republican River Basin	Shepler, R.; Suter, J.F.; Manning, D.T.; Goemans, C.	Journal Of The American Water Resources Association	2019	10.1111/1752-1688.12741	4	"This research explores motivations and behavior related to groundwater conservation among agricultural producers in the Colorado portion of the Republican River Basin, which is part of the Ogallala Aquifer."
1	Restoring the Paleo-West: Fossils, Coal, and Climate in Late Nineteenth-Century America	Zizzamia, D.	Environmental History	2019	10.1093/envhis/emy092	4	"Yet, by analyzing the novel imaginaries that emerged from the scientific and commercial interaction with fossils and coal in the late nineteenth century, this article reveals that the discovery of lush and lively paleo-environments also significantly influenced the history of this region."
1	Garbage in, Garbage Out Does Not Hold True for Indigenous Community Flood Extent Modeling in the Prairie Pothole Region	Thapa, A.; Bradford, L.; Strickert, G.; Yu, X.L.; Johnston, A.; Watson-Daniels, K.	Water	2019	10.3390/w11122486	4	"In this study, we developed spatial flood information for an indigenous community in Central Saskatchewan using LiDAR based DEM and a spatial modeling tool, the wetland DEM ponding model (WDPM)."
1	How Will We Eat and Produce in the Cities of the Future? From Edible Insects to Vertical Farming-A Study on the Perception and Acceptability of New Approaches	Specht, K.; Zoll, F.; Schumann, H.; Bela, J.; Kachel, J.; Robischon, M.	Sustainability	2019	10.3390/su11164315	6	"The aim of our study was to identify the perception of sustainability, social acceptability and ethical aspects of these new approaches and products in urban food production."
1	Discourses mapped by Q-method show governance constraints motivate landscape approaches in Indonesia	Langston, J.D.; McIntyre, R.; Falconer, K.; Sunderland, T.; van Noordwijk, M.; Boedhihartono, A.K.	Plos One	2019	10.1371/journal.pone.0211221	4	"We use Q-methodology to explore the perspectives of a group of experts in the landscape approach, both from academic and implementation fields, on what hinderances are in place to the realisation of achieving sustainable landscape management in Indonesia."
1	Where Has Turtle Ecology Been, and Where Is It Going?	Gibbons, J.W.; Lovich, J.E.	Herpetologica	2019	10.1655/0018-0831-075.1.4	4	"We briefly review the contributions of scientists who published extensively on turtle ecology in those and later decades up to the present."
1	Survey data of household perceptions of drought, mitigation and adaptation practices in East Nusa Tenggara, Indonesia	Kuswanto, H.; Hibatullah, F.; Soedjono, E.S.; Efendi, F.	Data In Brief	2019	10.1016/j.dib.2019.103944	4	"The information about perceptions of drought and mitigation and adaptation strategies was collected from the head of household or household member."
1	Interactive effects of the rootstock and the deficit irrigation technique on wine composition, nutraceutical potential, aromatic profile, and sensory attributes under semiarid and water limiting conditions	Romero, P.; Botia, P.; del Amor, F.M.; Gil-Munoz, R.; Flores, P.; Navarro, J.M.	Agricultural Water Management	2019	10.1016/j.agwat.2019.105733	4	"The main goal was to analyse the effects of the rootstock (R), irrigation method (IM), and their interaction (R x IM) on the final wine composition, volatile aromatic profile, and wine sensory attributes."

1	Farm management fragmentation in Nova Scotia does not affect farm habitat provision	Sherren, K.; Greenland-Smith, S.	Canadian Geographer-Geographe Canadien	2019	10.1111/cag.12491	4	"This paper uses a landholder survey (n = 350, 37% response rate) to explore the variety of farmland management fragmentation and its implications for habitat on farms, specifically ponds, wetlands, and woodlands."
1	Community perception and prioritization of invasive alien plants in Chitwan-Annapurna Landscape, Nepal	Shrestha, B.B.; Shrestha, U.B.; Sharma, K.P.; Thapa-Parajuli, R.B.; Devkota, A.; Siwakoti, M.	Journal Of Environmental Management	2019	10.1016/j.jenvman.2018.06.034	4	"We conducted 32 focus group discussions (FGDs) including 218 participants in Chitwan-Annapurna Landscape (ChAL) of central Nepal, to assess knowledge and perceptions of agrarian and forest-dependent communities about invasive alien plants (IAPs), document the efforts of the community management of IAPs and prioritize IAPs for management."
1	Observing the Impact of WWF Earth Hour on Urban Light Pollution: A Case Study in Berlin 2018 Using Differential Photometry	Jechow, A.	Sustainability	2019	10.3390/su11030750	4	"In this work, light pollution measurements during Earth Hour 2018 in an urban park (Tiergarten) in Berlin, Germany, are reported."
1	Forest ecological heterogeneity determines contrasting relationships between crown defoliation and tree diversity	Iacopetti, G.; Bussotti, F.; Selvi, F.; Maggino, F.; Pollastrini, M.	Forest Ecology And Management	2019	10.1016/j.foreco.2019.06.017	4	"This paper analyses the relationships between defoliation and forest diversity in a country (Italy) characterised by heterogeneous bioclimatic and edaphic characteristics (from Mediterranean to Alpine) and with a wide range of forest tree species and functional groups."
1	Whole-Genome Sequencing of Three Native Cattle Breeds Originating From the Northernmost Cattle Farming Regions	Weldenegodguad, M.; Popov, R.; Pokharel, K.; Ammosov, L.; Ming, Y.; Ivanova, Z.; Kantanen, J.	Frontiers In Genetics	2019	10.3389/fgene.2018.00728	4	"In this study, we performed whole-genome sequencing to genetically characterize three rare native breeds Eastern Finncattle, Western Finncattle and Yakutian cattle adapted to these northern Eurasian regions."
1	Searching for responsible and sustainable recreational fisheries in the Anthropocene	Cooke, S.J.; Twardek, W.M.; Reid, A.J.; Lennox, R.J.; Danylchuk, S.C.; Brownscombe, J.W.; Bower, S.D.; Arlinghaus, R.; Hyder, K.; Danylchuk, A.J.	Journal Of Fish Biology	2019	10.1111/jfb.13935	4	"We argue that the future of recreational fisheries and indeed many wild fish populations and aquatic ecosystems depends on having responsible and sustainable (R&S) recreational fisheries whilst, where possible, addressing, or at least lobbying for increased awareness about the threats to recreational fisheries emanating from outside the sector (e.g., climate change)."
1	Gypsum and Carbon Amendments Influence Leachate Quality from Two Soils in Ohio, USA	Walia, M.K.; Dick, W.A.	Soil Science Society Of America Journal	2019	10.2136/sssaj2018.06.0220	4	"A greenhouse experiment was conducted to study the leachate quality in response to addition of crop residues (0 and 13.4 Mg ha(-1)), glucose (0 and 4.5 Mg ha(-1)), and gypsum (0, 8.9, and 26.9 Mg ha(-1)) to Wooster silt loam (mixed, mesic Typic Fragiudalfs) and Hoytville clay loam (fine, illitic, mesic Mollic Epiaqualfs) soils."
1	Heterogeneous Perceptions of Social-Ecological Change Among Small-Scale Fishermen in the Central Gulf of California: Implications for Adaptive Response	Frawley, T.H.; Crowder, L.B.; Broad, K.	Frontiers In Marine Science	2019	10.3389/fmars.2019.00078	4	Here, we explore knowledge production and adaptive response within a small-scale fishery in the central Gulf of California following system perturbation. Using mixed methods from the natural and social sciences, we (1) identify local drivers of social-ecological change, (2) document knowledge concerning their causes and consequences across a diverse group of small-scale fishermen, and (3) identify patterns of intracultural agreement and disagreement associated with divergent adaptive response.
1	Integrating Traditional Ecological Knowledge and Remote Sensing for Monitoring Rangeland Dynamics in the Altai Mountain Region	Paltsyn, M.Y.; Gibbs, J.P.; Mountrakis, G.	Environmental Management	2019	10.1007/s00267-018-01135-6	4	"We contrasted pastoralists' perception of summer pasture quality in the Altai Mountains of Central Asia with normalized difference vegetation index (NDVI) metrics obtained from Terra Moderate Resolution Imaging Spectroradiometer (MODIS) satellite sensor."
1	Resilience of Small-Scale Fishers to Declining Fisheries in the Gulf of Thailand	Satumanatpan, S.; Pollnac, R.	Coastal Management	2019	10.1080/08920753.2020.1689769	4	"This study examines factors affecting perceptions of resilience among small-scale fishers in the Gulf of Thailand."
1	Status and Magnitude of Grey Wolf Conflict with Pastoral Communities in the Foothills of the Hindu Kush Region of Pakistan	Khan, T.U.; Luan, X.F.; Ahmad, S.; Mannan, A.; Khan, W.; Khan, A.A.; Khan, B.U.; Din, E.U.; Bhattarai, S.; Shah, S.; Saeed, S.; Amara, U.	Animals	2019	10.3390/ani9100787	4	"This study aims to determine the status and nature of human-wolf conflict across different villages in the Hind Kush region of Pakistan during the period January 2016-December 2016."
1	Local agro-pastoralists' perspectives on forage species diversity, habitat distributions, abundance trends and ecological drivers for sustainable livestock production in West Africa	Naah, J.B.S.N.; Braun, B.	Scientific Reports	2019	10.1038/s41598-019-38636-1	4	"In estimating, assessing and investigating the ecological variables, we performed elaborate ethnobotanical surveys in seven villages in northern Ghana and nine villages in southern-central Burkina Faso."
1	Growing vulnerability in the small-scale fishing communities of Maio, Cape Verde	Dancette, R.	Maritime Studies	2019	10.1007/s40152-019-00137-2	4	"This study depicts the increasing vulnerability of Maio's (island of Cape Verde's archipelago) small-scale fishing communities that rely directly on rich but declining fish stocks."
1	My land is my food: Exploring social function of large land deals using food security-land deals relation in five Eastern European countries	Petrescu-Mag, R.M.; Petrescu, D.C.; Reti, K.O.	Land Use Policy	2019	10.1016/j.landusepol.2019.01.003	4	"The objective of the study is two folded: to investigate five Eastern European countries characteristics which are valued as determinants of food security-large land deals relation and to highlight the social utility of agricultural land property."
1	Smallholder Farmers' Adaptation to Drought: Identifying Effective Adaptive Strategies and Measures	Muthelo, D.; Owusu-Sekyere, E.; Ogundeji, A.A.	Water	2019	10.3390/w11102069	4	"The objective of this paper was to identify the current adaptation and coping measures used by smallholder farmers, with a particular emphasis on farmers' vulnerability to drought and the adaptive measures or strategies that are effective in the study area."
1	Enhancing healthy ecosystems in northern Ghana through eco-friendly farm-based practices: insights from irrigation scheme-types	Agula, C.; Mabe, F.N.; Akudugu, M.A.; Dittoh, S.; Ayambila, S.N.; Bawah, A.	Bmc Ecology	2019	10.1186/s12898-019-0254-8	4	"This paper examines the ecosystem-based farm management practices (EBFMPs) in private and state-managed irrigation schemes. It also analyses the drivers of farmers' willingness to pay for EBFMPs sustainability."
1	Bridging Indigenous and science-based knowledge in coastal and marine research, monitoring, and management in Canada	Alexander, S.M.; Provencher, J.F.; Henri, D.A.; Taylor, J.J.; Lloren, J.I.; Nanayakkara, L.; Johnson, J.T.; Cooke, S.J.	Environmental Evidence	2019	10.1186/s13750-019-0181-3	4	"This systematic map examined the extent, range, and nature of the published literature (i.e., commercially published and grey) that seeks to respectively bridge Indigenous and science-based knowledge in coastal and marine research and management in Canada."
1	Climate change, future warming, and adaptation in Europe	Pasqui, M.; Di Giuseppe, E.	Animal Frontiers	2019	10.1093/af/vfy036	4	Adaptation to climate change in Europe
1	A herder's duty is to think: landscape partitioning and folk habitats of Mongolian herders in a mountain forest steppe (Khuvsugul-Murun region)	Gantuya, B.; Avar, A.; Babai, D.; Molnar, A.; Molnar, Z.	Journal Of Ethnobiology And Ethnomedicine	2019	10.1186/s13002-019-0328-x	4	"Our objectives were to reconstruct the folk habitats and the partitioning of the landscape into these folk habitats by Mongolian herders in Northern Mongolia and to compare it with other Northern Hemisphere boreal-temperate classifications."

1	Agroforestry as a climate change mitigation practice in smallholder farming: evidence from Kenya	De Giusti, G.; Kristjanson, P.; Rufino, M.C.	Climatic Change	2019	10.1007/s10584-019-02390-0	4	"This work examines the agroecological and socio-economic factors that condition profitability and acceptance of agroforestry by smallholder farmers in Western Kenya."
1	What Do Romanian Farmers Think about the Effects of Pesticides? Perceptions and Willingness to Pay for Bio-Pesticides	Petrescu-Mag, R.M.; Banatean-Dunea, I.; Vesa, S.C.; Copacinschi, S.; Petrescu, D.C.	Sustainability	2019	10.3390/su11133628	4	"This study aimed to find out if Romanian farmers' perceptions regarding the effects of conventional pesticides on pests, health, and the environment can predict farmers' willingness to replace conventional pesticides with bio ones and to pay a higher price for the latter."
1	Information exchange links, knowledge exposure, and adoption of agricultural technologies in northern Uganda	Shikuku, K.M.	World Development	2019	10.1016/j.worlddev.2018.11.012	4	"This study systematically examines the relationship between social distance and the likelihood of information exchange, subsequently evaluating effects on awareness, knowledge, and adoption of drought-tolerant (DT) varieties of maize, disease-resistant varieties of groundnuts and conservation farming."
1	What does it Mean to Make a 'Joint' Decision? Unpacking Intra-household Decision Making in Agriculture: Implications for Policy and Practice	Acosta, M.; van Wessel, M.; van Bommel, S.; Ampaire, E.L.; Twyman, J.; Jassogne, L.; Feindt, P.H.	Journal Of Development Studies	2019	10.1080/00220388.2019.1650169	4	"This paper contributes to a more nuanced understanding of the empowerment effects of joint decision-making, based on case study data from Uganda. We present survey data revealing significant gender differences in perception of decision-making over the adoption of agricultural practices and consumption expenses."
1	Tropical seabirds sample broadscale patterns of marine contaminants	Gilmour, M.E.; Hudson, S.A.T.; Lamborg, C.; Fleishman, A.B.; Young, H.S.; Shaffer, S.A.	Science Of The Total Environment	2019	10.1016/j.scitotenv.2019.07.147	4	"We evaluated the utility of seabirds, highly-mobile marine predators, as broad samplers of contaminants throughout three tropical ocean regions. Our aim was to fill a knowledge gap in the distributions of, and processes that contribute to, tropical marine contaminants; and explore how species-specific foraging ecologies could inform or bias our understanding of contaminant distributions."
1	Challenges to implementing greenhouse gas mitigation measures in livestock agriculture: A conceptual framework for policymakers	Kipling, R.P.; Taft, H.E.; Chadwick, D.R.; Styles, D.; Moorby, J.	Environmental Science & Policy	2019	10.1016/j.envsci.2018.11.013	4	"Here, a study of the barriers to implementing GHG mitigation measures on sheep, beef and dairy farms in Wales provides insights into challenges for these sectors globally." GHG= Greenhouse gases
1	Should I stay or should I go? Fishers' ability and willingness to adapt to environmental change in Cambodia's Tonle Sap Lake	Bahadur, K.C.K.; Seng, R.; Fraser, E.	Fisheries Management And Ecology	2019	10.1111/fme.12341	4	"This study assesses how small-scale fisheries' livelihoods are changing in response to social and environmental conditions using the opinions of fishers collected through an intensive family survey of 514 households from Pursat and Battambang Provinces in Cambodia."
1	Between Environmental Change and Neoliberalism: The Effects of Oil Palm Production on Livelihood Resilience	Abrams, J.; Pischke, E.C.; Mesa-Jurado, M.A.; Eastmond, A.; Silva, C.A.; Moseley, C.	Society & Natural Resources	2019	10.1080/08941920.2018.1544678	4	"Here we examine the impacts of oil palm production on marginal rural communities in Mexico that have experienced both the economic changes associated with neoliberal policy reforms and the dynamics of environmental change."
1	Farmer adaptation to reduced groundwater availability	Running, K.; Burnham, M.; Wardropper, C.; Ma, Z.; Hawes, J.; du Bray, M.V.	Environmental Research Letters	2019	10.1088/1748-9326/ab4ccc	4	"We use survey data from 265 farmers in southeastern Idaho who, beginning in 2016, were required to cut annual groundwater withdrawals by 4%?20% to identify (1) the adaptation practices farmers implemented; (2) how reported crop yields and farm income were impacted; and (3) how adaptation practices varied by farm and farmer characteristics."
1	Key social processes sustaining the farmer/advisor relationship	Kuehne, G.; Nettle, R.; Llewellyn, R.	Rural Extension And Innovation Systems Journal	2019		4	"This paper describes and analyses the building and maintenance of the farmer-advisor relationship from the perspective of farmers in the south-eastern Australian grains industry."
1	Resilience from the ground up: how are local resilience perceptions and global frameworks aligned?	Beauchamp, E.; Abdella, J.; Fisher, S.; McPeak, J.; Patnaik, H.; Koulibaly, P.; Cisse, D.; Toure, M.; Bocoum, A.; Ndao, M.; Deme, Y.; Gueye, B.	Disasters	2019	10.1111/disa.12342	4	"This article draws on research on the Decentralising Climate Funds project of the Building Resilience and Adaptation to Climate Extremes and Disasters programme, which supports communities in Mali and Senegal to improve climate resilience through locally controlled adaptation funds. It explores attributes of resilience from this bottom-up perspective to assess its predictors and alignment with food security, as a proxy of well-being."
1	The colour of maize: Visions of green growth and farmers perceptions in northern Laos	Kallio, M.H.; Hogarth, N.J.; Moeliono, M.; Brockhaus, M.; Cole, R.; Bong, I.W.; Wong, G.Y.	Land Use Policy	2019	10.1016/j.landusepol.2018.10.006	4	"Based on farmers' perceptions, we study: (1) farmers' reasons for adopting and abandoning maize, and; (2) implications of commercial maize expansion on local livelihood security and inclusiveness (food supply, income, risk coping, and ability to join maize growing), and environmental sustainability (productivity, and soil and forest quality) over time (2013 and 2016)."
1	Highlighting the potential of peer-led workshops in training early-career researchers for conducting research with Indigenous communities	MacMillan, G.A.; Falardeau, M.; Girard, C.; Dufour-Beausejour, S.; Lacombe-Bergeron, J.; Menzies, A.K.; Henri, D.A.	Facets	2019	10.1139/facets-2018-0046	4	Two peer-led workshops for Canadian ECRs were organized in 2016 and 2017 with the following objectives: (i) to cultivate awareness about Indigenous cultures, histories, and languages; (ii) to promote sharing of Indigenous and non-Indigenous ways of knowing; and (iii) to foster approaches and explore tools for conducting community-collaborative research. Here we present these peer-led Intercultural Indigenous Workshops and discuss workshop outcomes.
1	Developing stakeholder-driven scenarios on land sharing and land sparing - Insights from five European case studies	Karner, K.; Cord, A.F.; Hagemann, N.; Hernandez-Mora, N.; Holzkamper, A.; Jeangros, B.; Lienhoop, N.; Nitsch, H.; Rivas, D.; Schmid, E.; Schulp, C.J.E.; Strauch, M.; van der Zanden, E.H.; Volk, M.; Willaarts, B.; Zarrineh, N.; Schonhart, M.	Journal Of Environmental Management	2019	10.1016/j.jenvman.2019.03.050	4	"The objective of the presented research is to develop comparable participatory regional land use scenarios for the year 2030 reflecting land sharing, land sparing and more intermediate developments across five different European landscapes (Austria, Germany, Switzerland, The Netherlands and Spain)."
1	Well-being outcomes of marine protected areas	Ban, N.C.; Gurney, G.G.; Marshall, N.A.; Whitney, C.K.; Mills, M.; Gelcich, S.; Bennett, N.J.; Meehan, M.C.; Butler, C.; Ban, S.; Tran, T.C.; Cox, M.E.; Breslow, S.J.	Nature Sustainability	2019	10.1038/s41893-019-0306-2	4	"We synthesized research from 118 peer-reviewed articles that analyse outcomes related to marine protected areas on people, and found that half of documented well-being outcomes were positive and about one-third were negative."
1	Perceptions regarding active management of the Cross-timbers forest resources of Oklahoma, Texas, and Kansas: A SWOT-ANP analysis	Starr, M.; Joshi, O.; Will, R.E.; Zou, C.B.	Land Use Policy	2019	10.1016/j.landusepol.2018.11.004	4	"This study utilized a mixed mode data collection method, which involved focus group meetings as well as online survey administration, to determine how stakeholders perceive active management in the Cross-timbers forests."
1	Is REDD plus More of an Institutional Affair than a Market Process? The Concealed Social and Cultural Consequences of an Ongoing REDD plus Project in Kolo Hills, Tanzania	Bartholdson, O.; Abdallah, J.M.; Marquardt, K.; Salomonsson, L.	Forests	2019	10.3390/f10080618	4	"This research project follows the planning and implementation process of a REDD+ project in the Kolo Hills, Tanzania. The analysis showed that the project's main objectives were poorly understood by the men and women of the target group, who interpreted it as yet another top-down postcolonial project."
1	Education and knowledge determine preference for bark beetle control measures in El Salvador	Thorn, S.; Leverkus, A.B.; Thorn, C.J.; Beudert, B.	Journal Of Environmental Management	2019	10.1016/j.jenvman.2018.11.032	4	"To determine the acceptability of bark beetle control measures in El Salvador, we assessed how demographic variables, attitude towards the bark beetle, education, and self-reported knowledge affected the preference for different bark beetle control measures in a survey of government employees and local forest owners using a quantitative questionnaire survey."
1	Soft Red and White Winter Wheat Response to Input-Intensive Management	Quinn, D.; Steinke, K.	Agronomy Journal	2019	10.2134/agronj2018.06.0368	4	"This study investigated soft winter wheat response to several agronomic inputs across intensive and traditional (i.e., low-input) management systems."

1	The effectiveness of drought risk management strategies in western Iran	Almasi, H.; Tavakkoli, J.	International Journal Of Disaster Risk Reduction	2019	10.1016/j.ijdrr.2019.101159	4	"This study is conducted to identify farmers' DRMS and their determinants in four villages of the mentioned province."
1	Assessment of Farmers' Perception on Rice Seed Production Standard in Nakhon Sawan Province, Lower Northern Thailand	Kummanee, K.; Aungsuratana, A.; Rojanaridpiched, C.; Chanprame, S.; Vijitsrikamol, K.; Sakurai, S.	Journal Of Agricultural Science And Technology	2019		4	"The objectives of this investigation were to determine general background of farmers, their existing rice seed production condition, their perception of rice seed production standard, and constraints on farmers' rice seed production."
1	Quantifying Farmers' Initiatives and Capacity to Cope with Drought: A Case Study of Xinghe County in Semi-Arid China	Guo, H.; Wu, Y.Y.; Shang, Y.R.; Yu, H.; Wang, J.A.	Sustainability	2019	10.3390/su11071848	4	"Famers' resources and initiatives to deal with drought were evaluated, and appropriate coping strategies are proposed by analyzing the differences between the coping capacities of two categories of farmers; tenants (with large holdings) and smallholders."
1	A Survey of Public Perceptions and Attitudes about Water Availability Following Exceptional Drought in Texas	Gholson, DM.; Boellstorff, D.E.; Cummings, S.R.; Wagner, K.L.; Dozier, M.C.	Journal Of Contemporary Water Research & Education	2019	10.1111/j.1936-704X.2019.03297.x	3	"The study investigates changes in public attitudes following the most intense one-year drought on record in Texas by evaluating public perception of water availability, assessing Texans' attitudes and perceptions regarding drought conditions, and comparing the number of Texans adopting practices to conserve water before and after the drought of 2011."
1	It starts at home? Climate policies targeting household consumption and behavioral decisions are key to low-carbon futures	Dubois, G.; Sovacool, B.; Aall, C.; Nilsson, M.; Barbier, C.; Henniann, A.; Bruyere, S.; Andersson, C.; Skold, B.; Nadaud, F.; Dorner, F.; Moberg, K.R.; Ceron, J.P.; Fischer, H.; Amelung, D.; Baltruszewicz, M.; Fischer, J.; Benevise, F.; Louis, V.R.; Sauerborn, R.	Energy Research & Social Science	2019	10.1016/j.erss.2019.02.001	4	"This paper investigates how behavioral change can achieve a substantial reduction in greenhouse gas emissions in European high-income countries."
1	Microalgae: A potential alternative to health supplementation for humans	Koyande, A.K.; Chew, K.W.; Rambabu, K.; Tao, Y.; Chu, D.T.; Show, P.L.	Food Science And Human Wellness	2019	10.1016/j.fshw.2019.03.001	4	"This review describes various microalgal sources of proteins and other bio-active components."
1	Land teleconnections of urban tourism: A case study of Taipei's agricultural souvenir products	Lee, Y.C.; Huang, S.L.; Liao, P.T.	Landscape And Urban Planning	2019	10.1016/j.landurbplan.2019.103616	4	"This paper presents a case study of Taiwan's signature specialty agricultural souvenir products, pineapple cakes, to demonstrate the ULTs of Taipei's tourism and to examine the ecological exchange relations between Taipei and remote areas that provide tourism-related resources."
1	Is stock enhancement the best option to manage fisheries? A case study from Taiarapu (French Polynesia)	Taiarui, M.; Foale, S.; Bambridge, T.; Sheaves, M.	Marine Policy	2019	10.1016/j.marpol.2019.02.026	4	"The present study investigated the potential impacts the planned Marava (Siganus argenteus) stock enhancement could have on local fishers from Taiarapu (French Polynesia)."
1	Framing nitrogen pollution in the British press: 1984-2018	Zottola, A.; Atanasova, D.; Cardwell, E.; Forrester, J.; Stevens, C.	Discourse & Communication	2019	10.1177/1750481319876772	4	"As public understanding of scientific issues is partly influenced by news reporting, this article is the first to study how the British press has discussed nitrogen pollution."
1	Drought adaptation measures and their effectiveness at Barind Tract in northwest Bangladesh: a perception study	Islam, M.S.; Hossain, M.Z.; Sikder, M.B.	Natural Hazards	2019	10.1007/s11069-019-03704-2	4	"This study is mainly based on primary data collected through a structured questionnaire by surveying the farming households from ten unions of three districts in western Barind. Farmers' perception about the effectiveness of adaptation measures has been measured using a five-point Likert scale."
1	Invasive forest pathogens in Europe: Cross-country variation in public awareness but consistency in policy acceptability	Eriksson, L.; Boberg, J.; Cech, T.L.; Corcobado, T.; Desprez-Loustau, M.L.; Hietala, A.M.; Jung, M.H.; Jung, T.; Lehtijarvi, H.T.D.; Oskay, F.; Slavov, S.; Solheim, H.; Stenlid, J.; Oliva, J.	Ambio	2019	10.1007/s13280-018-1046-7	4	"The public's awareness of IP problems and the acceptability of policies aiming to combat these pathogens were surveyed in nine European countries (N=3469)."
1	Enough is enough: how West African farmers judge water sufficiency	Roncoli, C.; Orlove, B.; Ungemach, C.; Dowd-Uribe, B.; West, C.T.; Milch, K.; Sanon, M.	Regional Environmental Change	2019	10.1007/s10113-018-1426-3	4	"This article engages the concept of water literacy, coupled with photo-elicitation methods and long-term ethnographic research, to explore how West African farmers judge water sufficiency."
1	Classic and cute: Framing biodiversity in Japan through rural landscapes and mascot characters	Lindstrom, K.	Popular Communication	2019	10.1080/15405702.2019.1567735	4	"This article analyzes two major frames that state institutions employ for communicating biodiversity: traditional agricultural landscapes called satoyama and embodied mascot characters called yurukyara."
1	Engaging Northern Indigenous Communities in Biophysical Research: Pitfalls and Successful Approaches	Eerkes-Medrano, L.; Huntington, H.P.; Castro, A.O.; Atkinson, D.E.	Arctic	2019	10.14430/arctic68194	4	"We encountered this issue when we visited three communities on Alaska's west coast to study impactful weather events and the formation of slush ice berms, which can protect towns from storm surges."
1	The Problem of Water Use in Rural Areas of Southwestern Spain: A Local Perspective	Pulido, M.; Barrena-Gonzalez, J.; Alfonso-Torreno, A.; Robina-Ramirez, R.; Keesstra, S.	Water	2019	10.3390/w11061311	4	"In this study, we have interviewed 132 people from the municipality of Arroyo de San Servan in order to know what the problems related to water use are, especially those that concern local people the most."
1	What should we conserve? Farmer narratives on biodiversity values in the McLaren Vale, South Australia	Bardsley, D.K.; Palazzo, E.; Stringer, R.	Land Use Policy	2019	10.1016/j.landusepol.2019.02.036	4	"By undertaking 'walk-and-talk' in-depth interviews with leading farmers in the South Australian viticultural region of the McLaren Vale, seven important narratives were identified on the way that farmers conceive of and exploit biodiversity on-farm."
1	Public Attitudes about Private Forest Management and Government Involvement in the Southeastern United States	Kreye, M.M.; Rimsaite, R.; Adams, D.C.	Forests	2019	10.3390/f10090776	4	"We present the results of a regional survey (n = 1669) of residents in Florida, Georgia, Mississippi, and South Carolina, which assessed attitudes toward timber harvesting and government involvement on private lands."
1	Perceptions on greywater reuse for home gardening activities in two rural villages of Fetakgomo Local Municipality, South Africa	Radingoana, M.P.; Dube, T.; Mollel, M.H.N.; Letsoalo, J.M.	Physics And Chemistry Of The Earth	2019	10.1016/j.pce.2019.02.009	4	"In this study, we assess the greywater reuse for home gardening in two rural communities (Ga-Seroka and Ga-Nkwana) in Limpopo Province, South Africa, using a mixed methods approach (Qualitative and Quantitative)"
1	Exploring the impact, response and preparedness to water-related natural disasters in the Barisal division of Bangladesh: a mixed methods study	Jagnoor, J.; Rahman, A.; Cullen, P.; Chowdhury, F.K.; Lukaszyk, C.; ul Baset, K.; Ivers, R.	Bmj Open	2019	10.1136/bmjopen-2018-026459	4	"Objectives To investigate the impact of natural disasters on communities in the Barisal division of Bangladesh, exploring community approaches to disaster preparedness and mitigation."

1	Gender-specific perspectives of mangrove ecosystem services: Case study from Bua Province, Fiji Islands	Pearson, J.; McNamara, K.E.; Nunn, P.D.	Ecosystem Services	2019	10.1016/j.ecoser.2019.100970	4	"This paper explores local perspectives of Fijian men and women on the use, benefit and value of mangrove ecosystems."
1	Farmers' perceptions and management of risk in rice-based farming systems of south-west coastal Bangladesh	Kabir, M.J.; Cramb, R.; Alauddin, M.; Gaydon, D.S.	Land Use Policy	2019	10.1016/j.landusepol.2019.04.040	4	"In this paper, we draw on a case study of typical village in the coastal zone to explore (1) farmers' perceptions of the cropping risks they face, (2) the implications of risk for the choice of cropping strategies within different farm types, and (3) the role of other farm and non-farm activities in mitigating risk to household livelihoods." Emphasizes market risks
1	Media Representations of Water Issues as Health Risks	Mayeda, A.M.; Boyd, A.D.; Paveglio, T.B.; Flint, C.G.	Environmental Communication-A Journal Of Nature And Culture	2019	10.1080/17524032.2018.1513054	4	"The objective of this research is to identify how newspaper media in four Western U.S. states frame the public health risks associated with water resources."
1	The role of flexibility in enabling transformational social change: Perspectives from an Indigenous community using Q-methodology	Gram-Hanssen, I.	Geoforum	2019	10.1016/j.geoforum.2019.02.001	4	"This paper explores the hypothesis that the flexibility of perspectives is central to enable the kind of changes called for by current and future environmental and socio-economic challenges. The paper reports on findings from a Q-study conducted with the Indigenous community of Igiugig, Alaska, focusing on perceptions of social change."
1	Co-producing a Research Agenda for Sustainable Palm Oil	Padfield, R.; Hansen, S.; Davies, Z.G.; Ehrensperger, A.; Slade, E.M.; Evers, S.; Papargyropoulou, E.; Bessou, C.; Abdullah, N.; Page, S.; Ancrenaz, M.; Aplin, P.; Dzulkafli, S.B.; Barclay, H.; Chellaiah, D.; Choudhary, S.; Conway, S.; Cook, S.; Copeland, A.; Campos-Arceiz, A.; Deere, N.J.; Drew, S.; Gilvear, D.; Gray, R.; Haller, T.; Hood, A.S.C.; Huat, L.K.; Huynh, N.; Kangayatkarasu, N.; Koh, L.P.; Kolandai, S.K.; Lim, R.A.H.; Yeong, K.L.; Lucey, J.M.; Luke, S.H.; Mitchell, S.L.; Montefrio, M.J.; Mullin, K.; Nainar, A.; Nekaris, K.A.I.; Nijman, V.; Nunes, M.; Nurhidayu, S.; O'Reilly, P.; Puan, C.L.; Ruppert, N.; Salim, H.; Schouten, G.; Tallontire, A.; Smith, T.E.L.; Tao, H.H.; Tham, M.H.; Varkkey, H.; Wadey, J.; Yule, C.M.; Azhar, B.; Sayok, A.K.; Vairappan, C.; Bicknell, J.E.; Struebig, M.J.	Frontiers In Forests And Global Change	2019	10.3389/ffgc.2019.00013	4	"Recognizing the expansion of oil palm agriculture across the tropics and the increasing awareness of environmental, social, and economic impacts, we seek to reorientate the existing research agenda toward one that addresses the most fundamental and urgent questions defined by the palm oil stakeholder community."
1	Responding to Risky Neighbors: Testing for Spatial Spillover Effects for Defensible Space in a Fire-Prone WUI Community	Warziniack, T.; Champ, P.; Meldrum, J.; Brenkert-Smith, H.; Barth, C.M.; Falk, L.C.	Environmental & Resource Economics	2019	10.1007/s10640-018-0286-0	4	"We test for these neighbor interactions with a case study on wildfire risk mitigation on private properties. We use two measures of wildfire risk mitigation-an assessment by a wildfire professional and a self-assessment by homeowners."
1	A Road Map for Conservation, Use, and Public Engagement around North America's Crop Wild Relatives and Wild Utilized Plants	Khoury, C.K.; Greene, S.; Krishnan, S.; Miller, A.J.; Moreau, T.	Crop Science	2019	10.2135/cropsci2019.05.0309	4	"A road map for collaborative action is presented here, focused on five priorities: (i) to understand and document North America's crop wild relatives and wild utilized plants, (ii) to protect threatened species in their natural habitats, (iii) to collect and conserve ex situ the diversity of prioritized species, (iv) to make this diversity accessible and attractive for plant breeding, research, and education, and (v) to raise public awareness of their value and the threats to their persistence."
1	Embracing diverse worldviews to share planet Earth	Kohler, F.; Holland, T.G.; Kotiaho, J.S.; Desrousseaux, M.; Potts, M.D.	Conservation Biology	2019	10.1111/cobi.13304	4	"We considered the wide global diversity of perspectives on the biosocial complex-the relationships and interactions between all living species on Earth-and argue that humanity's best chance for effective conservation is to take a pluralistic approach that engages seriously with the worldviews of all stakeholders."
1	Data Collection in Cross-cultural Ethnographic Research	Wutich, A.; Brewis, A.	Field Methods	2019	10.1177/1525822X19837397	4	"We report on techniques for efficient and effective cross-cultural data collection, drawn from 18 cross-cultural studies we conducted in 22 countries. We discuss research design, site selection and collaboration building, ethical review, cross-site protocol design, data collection pitfalls, and data quality checks."
1	Actor-specific risk perceptions and strategies for resilience building in different food systems in Kenya and Bolivia	Jacobi, J.; Mukhovi, S.; Llanque, A.; Toledo, D.; Speranza, C.I.; Kaser, F.; Augstburger, H.; Delgado, J.M.F.; Kiteme, B.P.; Rist, S.	Regional Environmental Change	2019	10.1007/s10113-018-1448-x	4	"In this study, we examined the resilience of food systems, firstly, by compiling the risks perceived by different food system actors in the Santa Cruz Department, Bolivia, and the northwestern Mount Kenya Region, Kenyatwo regions that are important to their respective national food supply."
1	Developing a measure for assessing tourists' empathy towards natural disasters in the context of wine tourism and the 2017 California wildfires	Bauman, M.J.; Yuan, J.X.; Williams, H.A.	Current Issues In Tourism	2019	10.1080/13683500.2019.1681944	3	"This study explores the tourism implications of natural disasters contextualized in the case of the California wildfires by examining the perceptions of wine tourists (N = 600) who visited a California winery within the past two years."
1	Embodied political ecology: Sensing agrarian change in north India	Kinkaid, E.	Geoforum	2019	10.1016/j.geoforum.2019.10.013	4	"I present and analyze organic farmers' narratives of agrarian change in Uttarakhand, demonstrating how these accounts foreground issues of embodiment including health, disease, bodily strength, sensory perception, and memory."
1	Turning water into wine: Exploring water security perceptions and adaptation behaviour amongst conventional, organic and biodynamic grape growers	Wheeler, S.A.; Marning, A.	Land Use Policy	2019	10.1016/j.landusepol.2018.12.034	3	"This study explores irrigators' water security perceptions and their water management adaptation behaviour using in-depth interviews and surveys with 37 conventional, organic and biodynamic grape growers in South Australia."
1	Sustainable Rangeland Management in Southwest Iran: Understanding Changes in Experts' Attitudes Toward Livelihood Alternatives	Khedrigharibvand, H.; Azadi, H.; Teklemariam, D.; Ebrahimi, A.; Ardali, E.O.; Van Acker, V.; Van Eetvelde, V.; De Maeyer, P.; Witlox, F.	Rangeland Ecology & Management	2019	10.1016/j.rama.2019.01.005	4	"In this study, changes in experts' attitudes, as a result of the knowledge-sharing process, in the context of rangeland management were assessed."

1	Socio-Ecological Niche and Factors Affecting Agroforestry Practice Adoption in Different Agroecologies of Southern Tigray, Ethiopia	Gebru, B.M.; Wang, S.W.; Kim, S.J.; Lee, W.K	Sustainability	2019	10.3390/su11133729	4	"This study was carried out in the southern zone of Tigray to identify and characterize traditional common agroforestry practices and understand the existing knowledge of farm households on the management of trees under different agroforestry in different agroecologies."
1	Analysing the potential of plant clinics to boost crop protection in Rwanda through adoption of IPM: the case of maize and maize stem borers	Silvestri, S.; Macharia, M.; Uzayisenga, B.	Food Security	2019	10.1007/s12571-019-00910-5	4	"In this study we sought to assess if plant clinics are making farmers more aware and knowledgeable of pests and diseases and are indirectly contributing to higher yields."
1	Explaining the Good Governance of Agricultural Surface Water Resources in the Gawshan Watershed Basin, Kermanshah, Iran	Tatar, M.; Papzan, A.; Ahmadvand, M.	Journal Of Agricultural Science And Technology	2019		4	"The purpose of this study was to explain the current water governance at Gawshan Watershed Basin in Kermanshah Province and then provide an alternative conceptual framework for good governance of water resources at the basin scale."
1	Users' perceptions and understanding of two urban wetlands in Harare, Zimbabwe	Mandishona, E.; Knight, J.	South African Geographical Journal	2019	10.1080/03736245.2019.1626759	6	"This study focuses on the perceptions of urban residents towards two wetlands in Harare, Zimbabwe, as a means of better evaluating their sustainability and management challenges."
1	Contested notions of disaster justice during the 2011 Bangkok floods: Unequal risk, unrest and claims to the city	Marks, D.; Connell, J.; Ferrara, F.	Asia Pacific Viewpoint	2019	10.1111/apv.12250	4	It contests some notions of disaster justice.
1	Do pro-environmental values, beliefs and norms drive farmers' interest in novel practices fostering the Bioeconomy?	Wensing, J.; Carraresi, L.; Broring, S.	Journal Of Environmental Management	2019	10.1016/j.jenvman.2018.11.114	4	"This paper addresses this gap by exploring drivers of farmers' interest in the valorisation of by-products."
1	Adaptation strategies to cope with low, high and untimely floods: Lessons from the Gash spate irrigation system, Sudan	Fadul, E.; Masih, I.; De Fraiture, C.	Agricultural Water Management	2019	10.1016/j.agwat.2019.02.035	4	"Stakeholders in spate irrigation systems have developed numerous measures to cope with uncertain water supply related to low, high and untimely floods. This research evaluates the effectiveness of these measures using the MULINO Decision Support System (mDSS4) tool which is based on the Driving force-PressureState-Impact-Response (DPSIR) framework."
1	Are Traditional Food Crops Really 'Future Smart Foods?' A Sustainability Perspective	Adhikari, L.; Tuladhar, S.; Hussain, A.; Aryal, K.	Sustainability	2019	10.3390/su11195236	4	"This study attempted to assess the potential of traditional food crops (TFCs) to be 'future smart foods' through the lens of sustainability."
1	Understanding biosecurity threat perceptions across Vietnamese smallholder farmers in Australia	Duong, T.T.; Brewer, T.D.; Luck, J.; Zander, K.K.	Crop Protection	2019	10.1016/j.cropro.2018.11.022	4	"In this study, we aim to understand the perceptions of smallholder farmers' on biosecurity threats and the factors influencing their perceptions."
1	Farmers' assessment of plant biosecurity risk management strategies and influencing factors: A study of smallholder farmers in Australia	Duong, T.T.; Brewer, T.D.; Luck, J.; Zander, K.K.	Outlook On Agriculture	2019	10.1177/0030727019829754	4	"In this study, we explore how Vietnamese smallholder farmers in Australia assess their biosecurity risk management strategies and the factors that explain their choice of different strategies."
1	Coasts in Peril? A Shoreline Health Perspective	Cooper, J.A.G.; Jackson, D.W.T.	Frontiers In Earth Science	2019	10.3389/feart.2019.00260	4	"In this paper we present an alternative approach to coastal assessment that centers on the physical integrity of the coast and its associated ecosystems both now and in the near-future."
1	The disappearance of water buffalo from agrarian landscapes in Western China	Rousseau, J.F.; Sturgeon, J.	Journal Of Agrarian Change	2019	10.1111/joac.12289	4	It addresses the transition from the use of buffalo to the subsistence of Chinese farmers, who moved towards ecological modernization.
1	Farmers' decisions to adapt to flash floods and landslides in the Northern Mountainous Regions of Vietnam	Pham, N.T.T.; Nong, D.; Garschagen, M.	Journal Of Environmental Management	2019	10.1016/j.jenvman.2019.109672	4	"This paper explores the decision-making process of rural households in adapting to flash floods and landslides (FF&LS) by conducting a household survey on 405 purposively selected households in Yen Bai province, one of the poorest mountainous regions in Vietnam."
1	Maize production under risk: The simultaneous adoption of off-farm income diversification and agricultural credit to manage risk	Akhtar, S.; Li, G.C.; Nazir, A.; Razzaq, A.; Ullah, R.; Faisal, M.; Naseer, M.A.U.R.; Raza, M.H.	Journal Of Integrative Agriculture	2019	10.1016/S2095-3119(18)61968-9	4	"This study is the first attempt to investigate the factors affecting the concurrent adoption of off-farm income diversification and agricultural credit which the farmers use to manage the risk to maize production."
1	Risk management strategies and residual risk perception in the wine industry: A spatial analysis in Northeast Italy	De Salvo, M.; Capitello, R.; Gaudenzi, B.; Begalli, D.	Land Use Policy	2019	10.1016/j.landusepol.2019.01.022	4	"This study explores the relationships between risk management strategies, residual risk perception as well as business and winegrower characteristics using a spatial-interdependency framework."
1	Determinants of Farmers' Decisions on Risk Coping Strategies in Rural West Java	Mutaqin, D.J.	Climate	2019	10.3390/cli7010007	4	"The objective of this study was to investigate the determinants of farmers' decisions on ex ante and ex post coping strategies in rural West Java, Indonesia."
1	Who are legitimate stakeholders? National and local perceptions of environmental change in the Lofoten islands, Norway	Kaltenborn, B.P.; Linnell, J.D.C.	Polar Geography	2019	10.1080/1088937X.2019.1648584	3	"We surveyed the resident Lofoten population and the larger Norwegian public to ascertain to what extent local and national perceptions of the value of selected environmental attributes and the importance of drivers of environmental change align across geographic scales."
1	Adapting the current mass mobilization approach in Ethiopia to enhance its impact on sustainable land management: Lessons from the Sago-kara watershed	Abi, M.; Kessler, A.; Oosterveer, P.; Tolossa, D.	Journal Of Environmental Management	2019	10.1016/j.jenvman.2019.109336	4	"This paper analyses the effect of an adapted - more participatory and more integrated - mass mobilization training approach on Ethiopian farmers' motivation to practice integrated farming and invest in Sustainable Land Management (SLM)."
1	Predictors of Participation in Invasive Species Control Activities Depend on Prior Experience with the Species	Kalnicky, E.A.; Brunson, M.W.; Beard, K.H.	Environmental Management	2019	10.1007/s00267-018-1126-2	4	"To inform the use of information strategies to control the invasive, non-native frog Eleutherodactylus coqui in Hawaii, USA, we surveyed over 700 property owners about their attitudes and behaviors regarding the species."
1	Social perception and determinants of Ngitili system adoption for forage and land conservation in Maswa district, Tanzania	Safari, J.; Singu, I.; Masanyiwa, Z.; Hyandye, C.	Journal Of Environmental Management	2019	10.1016/j.jenvman.2019.109498	4	"This study was conducted to assess the farmers' perception toward deferred grazing system of enclosures (Ngitili), examine the perceived benefits of Ngitili and define the socio-economic variables that potentially explain adoption of Ngitili"
1	Assessing stakeholders' risk perceptions in a vulnerable coastal tourism destination (Faro Beach, Southern Portugal)	Domingues, R.B.; Costas, S.; de Jesus, S.N.; Ferreira, O.	Journal Of Spatial And Organizational Dynamics	2019		3	"We analysed managers and scientists' views regarding risk perceptions of Faro Beach (Algarve) residents, contributing to the identification of differences and similarities towards a sustainable management."

1	Strategies for coping and adapting to flooding and their determinants: A comparative study of cases from Namibia and Zambia	Mabuku, M.P.; Senzanje, A.; Mudhara, M.; Jewitt, G.P.W.; Mulwafu, W.O.	Physics And Chemistry Of The Earth	2019	10.1016/j.pce.2018.12.009	4	"The purpose of this case study was to determine the adaptation strategies that are adopted by rural households to floods in the eastern part of the Zambezi Region in Namibia and the Mwandi District in Zambia."
1	Impact of Perceived Livelihood Risk on Livelihood Strategies: A Case Study in Shiyang River Basin, China	Su, F.; Saikia, U.; Hay, I.	Sustainability	2019	10.3390/su11123349	4	Perceived livelihood risk was evaluated by establishing an index system of livelihood risk (health, environmental, financial, social, and information and connectivity risks). Different livelihood strategies were identified, including reducing consumption, seeking help from relatives and friends, securing loans, seeking employment, and converting assets into cash.
1	Perception matters': New insights into the subjective dimension of resilience in the context of humanitarian and food security crises	Bene, C.; Frankenberger, T.; Griffin, T.; Langworthy, M.; Mueller, M.; Martin, S.	Progress In Development Studies	2019	10.1177/1464993419850304	4	"Drawing on the recent literature and the authors' own experience, a conceptual framework of subjective resilience is proposed. The framework helps locating the subjective element of resilience within the wider resilience conceptualization as currently developed in the literature on food security and to clarify how it links to the more tangible elements of that conceptualization."
1	Adoption and impact of improved maize varieties on maize yields: Evidence from central Cameroon	Takam-Fongang, G.M.; Kamdem, C.B.; Kane, G.Q.	Review Of Development Economics	2019	10.1111/rode.12561	4	"This study uses both the endogenous switching regression and propensity score matching models to analyze the adoption and impact of improved maize varieties on maize yields in central Cameroon."
1	Exploring the Drivers of Irrigator Mental Health in the Murray-Darling Basin, Australia	Yazd, S.D.; Wheeler, S.A.; Zuo, A.	Sustainability	2019	10.3390/su11216097	4	"We used a 2015-2016 survey, which randomly sampled 1000 irrigators from the southern Murray-Darling Basin, to model the drivers of irrigators' psychological distress."
1	Analysis of wheat farmers' risk perceptions and attitudes: evidence from Punjab, Pakistan	Ahmad, D.; Afzal, M.; Rauf, A.	Natural Hazards	2019	10.1007/s11069-018-3523-5	3	Location: Punjab. The study relies on a survey of six wheat-producing districts containing household farms with 402 wheat-producing farmers in Punjab, Pakistan.
1	Effects of Land-Use Practices on Woody Plant Cover Dynamics in Sahelian Agrosystems in Burkina Faso since the 1970s-1980s Droughts	Zida, W.A.; Bationo, B.A.; Waaub, J.P.	Sustainability	2019	10.3390/su11215908	4	"This study examines the contribution of agroforestry practices to the improvement of woody plant cover in the North of Burkina Faso after the 1970s-1980s droughts."
1	Identifying potential causes of fish declines through local ecological knowledge of fishers in the Ganga River, eastern Bihar, India	Dey, S.; Choudhary, S.K.; Dey, S.; Deshpande, K.; Kelkar, N.	Fisheries Management And Ecology	2019	10.1111/fme.12390	4	"In this paper, the causes of decline of 58 fish and two shrimp taxa were identified from LEK data (1999-2019) obtained from river-floodplain fisheries of the Gangetic plains (Bihar, India)."
1	How indebted farmers perceive and address financial risk in environmentally degraded areas in Bangladesh	Rahman, A.; Luo, J.C.; Adnan, K.M.M.; Il Islam, M.D.; Zhao, M.J.; Sarker, S.A.	Environmental Science And Pollution Research	2019	10.1007/s11356-019-07374-2	4	"In this study, the researcher collected data on 400 rice farmers (debtors) from six different districts in greater Dhaka division (most degraded area in Bangladesh) and adopted probit model to analyze the influential factors affecting farmers' financial risk management adoption decision and to identify the correlations between these decisions."
1	Surfing and marine conservation: Exploring surf-break protection as IUCN protected area categories and other effective area-based conservation measures	Scheske, C.; Rodriguez, M.A.; Buttazzoni, J.E.; Strong-Cvetich, N.; Gelcich, S.; Monteferri, B.; Rodriguez, L.F.; Ruiz, M.	Aquatic Conservation-Marine And Freshwater Ecosystems	2019	10.1002/aqc.3054	4	"Through a series of case studies from Peru, Chile and the USA, the paper discusses how, in areas where there is significant biodiversity or iconic seascapes, surf breaks can be integrated with marine conservation."
1	Electric mobility in the Sicilian short food supply chain	Giacomarra, M.; Tulone, A.; Crescimanno, M.; Galati, A.	Studies In Agricultural Economics	2019	10.7896/j.1907	4	"This paper is the first study to explore the intention of entrepreneurs operating in the Short Food Supply Chain to adopt electric mobility inside their business."
1	Understanding the Past and Present and Predicting the Future: Farmers' Use of Multiple Nutrient Best Management Practices in the Upper Midwest	Denny, R.C.H.; Marquart-Pyatt, S.T.; Houser, M.	Society & Natural Resources	2019	10.1080/08941920.2019.1574045	4	"Using social, economic and attitudinal variables we predict the use of multiple nitrogen best management practices at three time points: current use (2013), past use (before 2013), and likelihood of use on their largest field in the next three years."
1	Residents' wildfire evacuation actions in Mishkeegogamang Ojibway Nation, Ontario, Canada	McGee, T.K.; Nation, M.O.; Christianson, A.C.	International Journal Of Disaster Risk Reduction	2019	10.1016/j.ijdrr.2018.10.012	4	"Semi-structured interviews were completed to learn how people in Mishkeegogamang responded when they were told to evacuate and factors influencing their actions."
1	What influences European private forest owners' affinity for subsidies?	Quiroga, S.; Suarez, C.; Ficko, A.; Feliciano, D.; Bouriaud, L.; Brahic, E.; Deuffic, P.; Dobsinska, Z.; Jarsky, V.; Lawrence, A.; Nybakk, E.	Forest Policy And Economics	2019	10.1016/j.forpol.2018.08.008	4	"This study analyses the linkages between private forest owners' perceptions of forest management, and their affinity for subsidies, in a range of European countries."
1	Resilience of socio-ecological systems in volcano risk-prone areas, but how much longer? Assessment of adaptive water governance in Merapi volcano, Central Java, Indonesia	Sarrazin, C.; Gautier, E.; Holle, A.; Grancher, D.; de Belizal, E.; Hadmoko, D.S.	Geojournal	2019	10.1007/s10708-018-9856-5	4	"This present work first aims to discuss multiple social vulnerabilities and in some cases, the capacity to adapt, by investigating the hydraulic community's responses in the face of lahar issues after the 2010 Merapi eruption."
1	Determinants of Adaptation for Slow-Onset Hazards: The Case of Rice-Farming Households Affected by Seawater Intrusion in Northern Mindanao, Philippines	Almaden, C.R.C.; Rola, A.C.; Baconguis, R.D.T.; Pulhin, J.M.; Camacho, J.V.; Ancog, R.C.	Asian Journal Of Agriculture And Development	2019		4	"This study aimed to address the knowledge gaps on adaptive capacity of rural farming households to slow-onset hazards such as seawater intrusion."
1	Using conjoint analysis to gain deeper insights into aesthetic landscape preferences	Schirpke, U.; Tappeiner, G.; Tasser, E.; Tappeiner, U.	Ecological Indicators	2019	10.1016/j.ecolind.2018.09.001	4	"In this study, we aimed to estimate landscape preferences at the individual level based on a set of landscape indicators, allowing us to measure the preferences of each person."
1	Management and Perception of Metropolitan Natura 2000 Sites: A Case Study of La Mandria Park (Turin, Italy)	Battisti, L.; Corsini, F.; Gusmerotti, N.M.; Larcher, F.	Sustainability	2019	10.3390/su11216169	4	"The research aim was to investigate the user's aesthetic perception in relation to the adoption of different management measures, within an Italian metropolitan Natura 2000 site."
1	Droughts, livelihoods, and human migration in northern Ethiopia	Hermans, K.; Garbe, L.	Regional Environmental Change	2019	10.1007/s10113-019-01473-z	4	"Our study examines the effects of drought on livelihoods and human migration in the rural highlands of northern Ethiopia, one of the most affected regions during the 2015 drought. "

1	Assessing fertilizer use efficiency and its determinants for apple production in China	Bai, X.G.; Wang, Y.N.; Huo, X.X.; Salim, R.; Bloch, H.; Zhang, H.	Ecological Indicators	2019	10.1016/j.ecolind.2019.05.006	4	"This paper employed a stochastic frontier method to examine the technical efficiency and fertilizer use efficiency of apple production by adopting panel data of eight major apple production provinces in China from 1992 to 2014."
1	Modeling farmers' responsible environmental attitude and behaviour: a case from Iran	Farani, A.Y.; Mohammadi, Y.; Ghahremani, F.	Environmental Science And Pollution Research	2019	10.1007/s11356-019-06040-x	4	"Thus, this study aimed to model the responsible attitude and behavior of Iranian farmers in respect to environment."
1	Product vs. process? The role of geomorphology in wetland characterization	Lisenby, P.E.; Tooth, S.; Ralph, T.J.	Science Of The Total Environment	2019	10.1016/j.scitotenv.2019.01.399	4	"Here, we use examples from wetlands in the drylands of Africa, Australia, and North America to identify the capacity for adjustment (i.e. form and timescale of adjustment) of wetland landforms and we relate this capacity to the geomorphological concepts of sediment connectivity and landform sensitivity."
1	The explanatory power of silent comics: An assessment in the context of knowledge transfer and agricultural extension to rural communities in southwestern Madagascar	Stenchly, K.; Feldt, T.; Weiss, D.; Andriamparany, J.N.; Buerkert, A.	Plos One	2019	10.1371/journal.pone.0217843	4	"Three agricultural recommendations were chosen for comic-style illustrations, distributed to six communities in the Mahafaly region of southwestern Madagascar and evaluated using a three-step, interdependent approach. The silent comics illustrated (i) composting of manure and its application to improve soil fertility; (ii) cautious utilization of succulent silver thicket as supplementary forage; and (iii) sustainable harvesting practices of wild yam."
1	Forbidden fire: Does criminalising fire hinder conservation efforts in swidden landscapes of the Brazilian Amazon?	Carmenta, R.; Coudel, E.; Steward, A.M.	Geographical Journal	2019	10.1111/geoj.12255	4	"Forest conservation initiatives are often situated in contexts where swidden agriculture prevails, generating a need for an improved understanding of the interplay between fire management and conservation initiatives on the ground. We explore these dynamics through a case study approach in three leading forest conservation initiative types, situated across diverse contexts in the Brazilian Amazon: a Reduction of Emissions of Deforestation and Degradation (REDD+) site (in Middle SolimA mu es region), an extractive reserve (RESEX) (in Arapiuns region), and a Green Municipality Pact (GMP) (in Paragominas)."
1	Understanding farmers' intentions to adopt sustainable crop residue management practices: A structural equation modeling approach	Raza, M.H.; Abid, M.; Yan, T.W.; Naqvi, S.A.A.; Akhtar, S.; Faisal, M.	Journal Of Cleaner Production	2019	10.1016/j.jclepro.2019.04.244	4	"Based on the protection motivation theory framework, this study analyzes the socio-physiological factors affecting the farmers' intentions on adopting sustainable crop residue management practices."
1	Coping with drought: Reflection of communal cattle farmers in Umzingwane district in Zimbabwe	Ndlovu, T.	Jamba-Journal Of Disaster Risk Studies	2019	10.4102/jamba.v11i1.813	4	"Using the sustainable livelihoods framework, this article sought to examine prevalent coping strategies in Umzingwane district in Zimbabwe, some of which lay a foundation for building resilience drought."
1	Emerging disparities in community resilience to drought hazard in south-central United States	Mihunov, V.V.; Lam, N.S.N.; Rohli, R.V.; Zou, L.	International Journal Of Disaster Risk Reduction	2019	10.1016/j.ijdrr.2019.101302	4	"In search of new insights into the dynamics of hazard resilience, this study assessed the temporal changes of community resilience to the drought hazard in the south-central U.S."
1	Effects of Farmers' Yield-Risk Perceptions on Conservation Practice Adoption in Kansas	Ramsey, S.M.; Bergtold, J.S.; Canales, E.; Williams, J.R.	Journal Of Agricultural And Resource Economics	2019		4	"This study examines conservation adoption, with special consideration given to yield-risk perceptions."
1	Pest management: Reconciling farming practices and natural regulations	Brevault, T.; Clouvel, P.	Crop Protection	2019	10.1016/j.cropro.2018.09.003	4	"Here, we review and discuss this emerging approach for the development of agroecological management of insect pests, and necessary bridges between agronomy, ecology, and social sciences."
1	Farmers' diagnosis of current soil erosion status and control within two contrasting agro-ecological zones of Rwanda	Rutebuka, J.; Kagabo, D.M.; Verdoodt, A.	Agriculture Ecosystems & Environment	2019	10.1016/j.agee.2019.03.016	4	"This paper aimed to explore the current perceptions of farmers on soil erosion processes, soil erosion control (SEC) and their impacts on the adopted farming systems within two watersheds from contrasting AEZs, i.e. Murehe in the Eastern plateau and Tangata in the Buberuka highlands, using participatory survey data from 300 households collected during face-to-face interviews in 2017."
1	Tackling fall armyworm (Spodoptera frugiperda) outbreak in Africa: an analysis of farmers' control actions	Tambo, J.A.; Day, R.K.; Lamontagne-Godwin, J.; Silvestri, S.; Beseh, P.K.; Oppong-Mensah, B.; Phiri, N.A.; Matimelo, M.	International Journal Of Pest Management	2019	10.1080/09670874.2019.1646942	4	"Using survey data from Ghana and Zambia, we examined FAW prevention and control methods implemented by farm households and their impacts on maize output and household consumption of self-produced maize." FAW= Fall armyworm
1	The impact of the 2015-16 El Nino drought on the irrigated home gardens of the Komati downstream development project, Swaziland	Terry, A.K.	South African Geographical Journal	2019	10.1080/03736245.2019.1614477	4	"This project was designed to extend irrigated sugar cane onto customary tenured Swazi Nation Land, with a secondary objective to improve food security by enabling farmers to convert some land from rain-fed to irrigated maize and vegetable production."
1	A possible resolution of Malaysian sunset industry by green fertilizer technology: factors affecting the adoption among paddy farmers	Adnan, N.; Nordin, S.M.; Rasli, A.M.	Environmental Science And Pollution Research	2019	10.1007/s11356-019-05650-9	4	"This paper attempts to evaluate the contributing socio-psychological factors, innovation attributes of environmental factors, and channels of communication to decision-making among farmers in Malaysia on GFT."
1	Shrub cover homogenizes small mammals' activity and perceived predation risk	Loggins, A.A.; Shrader, A.M.; Monadjem, A.; McCleery, R.A.	Scientific Reports	2019	10.1038/s41598-019-53071-y	4	"Our goal for this study was to understand how vegetation structure in an African savanna shaped the perceived predation risk of small mammals, hence affecting their activity."
1	Holocene and recent aeolian reactivation of the Willandra Lakes lunettes, semi-arid southeastern Australia	Fitzsimmons, K.E.; Spry, C.; Stern, N.	Holocene	2019	10.1177/0959683618824790	4	"Our study reconstructs past geomorphological conditions and patterns of human mobility in adjacent Lakes Mungo and Durthong over the last c. 15 ka subsequent to final lake retreat, including the most recent 150 years since Europeans established pastoralism in the region."
1	Perceptions of system-identity and regime shift for marine ecosystems	van Putten, I.; Boschetti, F.; Ling, S.; Richards, S.A.	Ices Journal Of Marine Science	2019	10.1093/icesjms/fsz058	4	"We surveyed marine scientists in Tasmania, Australia, and determined the effect of changing conditions (including type of climate impact, species loss, species composition, spatio-temporal extent, and human intervention) on their perception of marine regime shift."
1	Stakeholder engagement in the study and management of invasive alien species	Shackleton, R.T.; Adriaens, T.; Brundu, G.; Dehnen-Schmutz, K.; Estevez, R.A.; Fried, J.; Larson, B.M.H.; Liu, S.; Marchante, E.; Marchante, H.; Moshobane, M.C.; Novoa, A.; Reed, M.; Richardson, D.M.	Journal Of Environmental Management	2019	10.1016/j.jenvman.2018.04.044	4	"We reviewed the literature in the ISI Web of Science on stakeholder engagement (the process of involving stakeholders (actors) in decision making, management actions and knowledge creation) in invasion science to assess and understand what has been done (looking at approaches and methodologies used, stakeholders involved, and outcomes from engagement) and to make recommendations for future work."
1	Technical training and rice farmers' adoption of low-carbon management practices: The case of soil testing and formulated fertilization technologies in Hubei, China	Liu, Y.; Ruiz-Menjivar, J.; Zhang, L.; Zhang, J.B.; Swisher, M.E.	Journal Of Cleaner Production	2019	10.1016/j.jclepro.2019.04.026	4	"The purpose of this study is to examine the impact of technical training on low-carbon management practices, specifically on the adoption of soil testing and formulated fertilization technologies."

1	What matters to whom and why? Understanding the importance of coastal ecosystem services in developing coastal communities	Lau, J.D.; Hicks, C.C.; Gurney, G.G.; Ginner, J.E.	Ecosystem Services	2019	10.1016/j.ecoser.2018.12.012	4	"In this paper, we examine how people ascribe and explain the importance of a range of marine and terrestrial ecosystem services in three coastal communities in Papua New Guinea."
1	Systems Analysis of Vulnerability to Hydrometeorological Threats: An Exploratory Study of Vulnerability Drivers in Northern Zimbabwe	Mavhura, E.	International Journal Of Disaster Risk Science	2019	10.1007/s13753-019-0217-x	4	"Using a systems approach, this study explores ways in which communities in the northern semiarid tropics of Zimbabwe are vulnerable to hydrometeorological threats."
1	Perennial grains for Africa: possibility or pipedream?	Snapp, S.; Roge, P.; Okori, P.; Chikowo, R.; Peter, B.; Messina, J.	Experimental Agriculture	2019	10.1017/S0014479718000066	4	"In this paper, we review the literature to explore what has been potentially overlooked, including missed opportunities as well as the disadvantages associated with perennial grains."
1	The plight of some of the poorest of the poor: vulnerabilities of fishing families on Kutubdia Island, Bangladesh	Rahman, M.K.; Schmidlin, T.W	Environmental Hazards-Human And Policy Dimensions	2019	10.1080/17477891.2019.1612728	4	"This research surveyed 300 fishing households on Kutubdia Island, Bangladesh, regarding their fishing activities and the conditions and perceptions of risk while fishing at sea. This is an artisanal fishery of small boats used for day trips, and larger but still simple boats used for multi-day trips farther offshore. Many households (62%) reported sickness or health problems while at sea."
1	Public Attitudes, Preferences and Willingness to Pay for River Ecosystem Services	Khan, I.; Lei, H.D.; Ali, G.; Ali, S.; Zhao, M.J.	International Journal Of Environmental Research And Public Health	2019	10.3390/ijerph16193707	4	"In this study, we explored the public awareness, attitude and perception regarding environmental and water resource issues and assessed the willingness to pay (WTP) for improving selected attributes of the Wei River basin."
1	Spatio-temporal analysis of rainfall variability and seasonality in Malawi	Haghtalab, N.; Moore, N.; Ngongondo, C.	Regional Environmental Change	2019	10.1007/s10113-019-01535-2	4	"The main goal of this study is to test both statistically significant and robust but less significant changes in rainfall and rainy season for 1981-2018 using a high-resolution gridded dataset (0.05 degrees)."
1	Eco-Hauling' principles to reduce carbon emissions and the costs of earthmoving - A case study	Krantz, J.; Feng, K.L.; Larsson, J.; Olofsson, T.	Journal Of Cleaner Production	2019	10.1016/j.jclepro.2018.10.113	4	"This paper therefore aims to increase awareness and understanding within the industry of the potential reductions of both carbon dioxide emissions and the costs of earthmoving activities that could be achieved through the use of Eco-Driving principles."
1	Valuing the Multiple Impacts of Household Food Waste	von Massow, M.; Parizeau, K.; Gallant, M.; Wickson, M.; Haines, J.; Ma, D.W.L.; Wallace, A.; Carroll, N.; Duncan, A.M.	Frontiers In Nutrition	2019	10.3389/fnut.2019.00143	4	"In this paper, we describe the results of an uncommonly detailed observational study of household food waste."
1	Sperm collection and storage for the sustainable management of amphibian biodiversity	Browne, R.K.; Silla, AJ.; Upton, R.; Della-Togna, G.; Marcec-Greaves, R.; Shishova, N.V.; Uteshev, V.K.; Proano, B.; Perez, O.D.; Mansour, N.; Kaurova, SA.; Gakhova, E.N.; Cosson, J.; Dyzuba, B.; Kramarova, L.I.; McGinnity, D.; Gonzalez, M.; Clulow, J.; Clulow, S.	Theriogenology	2019	10.1016/j.theriogenology.2019.03.035	4	"In the present review we provide a nascent phylogenetic framework for integration with other research lines to further the potential of amphibian sperm banking."
12	"There's Not Really Much Consideration Given to the Effect of the Climate on NCDs"- Exploration of Knowledge and Attitudes of Health Professionals on a Climate Change-NCD Connection in Barbados	Springer, R.A.; Elliott, S.J.	Int J Environ Res Public Health	2019	10.3390/ijerph17010198	3	Ten Barbadian health professionals were interviewed to assess their knowledge of health risks of climate change as it relates to NCDs in Barbados as a case study of a small island state at risk.
4	Chapter 16 - Conservation of Pantepui: between complex emergency and climate change	Bevilacqua, M.;Señaris, C.;Huber, O	The Pristine "Lost World" of the Neotropical Guiana Highlands. Book: Biodiversity of Pantepui	2019	10.1016/B978-0-12-815591-2.00016-1	10	The Chapter is part of the book "Biodiversity of Pantepui". In this chapter, the relationships between the development models of progressive governments in Latin America during the last decade and the failure of natural resource management institutions in the Guiana Shield region are explored.
4	Chapter 34 - Climate change vulnerability and ocean governance	Blasiak, R.	Sustainability of Ocean and Human Systems Amidst Global Environmental Change. Book: Predicting Future Oceans	2019	10.1016/B978-0-12-817945-1.00039-3	10	The Chapter is part of the book "Predicting Future Oceans", therefore, it will not be included in the selection. A new index of vulnerability to climate change impacts on fisheries has demonstrated that the most vulnerable countries are also among the world's least developed. Moreover, an analysis of official development assistance (ODA) shows a rapid decrease in funding for programs promoting sustainable fisheries, and allocation decisions largely unrelated to the consideration of vulnerability.
4	National REDD+ outcompetes gold and logging: The potential of cleaning profit chains	Overman, H.;Cummings, A.R.;Luzar, J.B.;Fragoso, J.M.	World Development	2019	10.1016/j.worlddev.2019.02.010	4	Combining nationwide data over a decade from Guyana's United Nations-approved Forest Reference Emission Level (FREL) submission and national documents, we found that REDD+ implemented at national level would annually add almost a quarter to the country's budget, and should not incentivize land grabbing as it places little direct value on forest, but financial penalties (lost income) on forest damage.
6	Co-developing climate services for public health: Stakeholder needs and perceptions for the prevention and control of Aedes-transmitted diseases in the Caribbean	Stewart-Ibarra, A.M.; Romero, M.; Hinds, A.Q.J.; Lowe, R.; Mahon, R.; Van Meerbeeck, C.J.; Rollock, L.; Gittens-St Hilaire, M.; St Ville, S.; Ryan, S.J.; Trotman, A.R.; Borbor-Cordova, M.J.	Plos Neglected Tropical Diseases	2019	10.1371/journal.pntd.0007772	4	The objective of this study was to identify health and climate stakeholder perceptions and needs in the Caribbean, with respect to the development of climate services for arboviruses.
10	Community-based adaptation to climate change in small island developing states: an analysis of the role of social capital	Hagedoorn, L.C.; Brander, L.M.; van Beukering, P.J.H.; Dijkstra, H.M.; Franco, C.; Hughes, L.; Gilders, I.; Segal, B.	Climate and Development	2019	10.1080/17565529.2018.1562869	4	With a focus on the role of social capital, this paper provides a quantitative analysis of determinants of household intention to participate in community adaptation projects, using data from a household survey and discrete choice experiment conducted in a coastal community in the Federated States of Micronesia.

10	Vulnerable groups and preliminary insights into intersecting categories of identity in Laamu Atoll, Maldives	McNamara, K.E.; Clissold, R.; Piggott-Mckellar, A.; Buggy, L.; Azfa, A.	Singapore Journal of Tropical Geography	2019	10.1111/sjtg.12280	4	Through ten semi-structured interviews with 24 stakeholders, this study collected local perceptions on the following groups considered most vulnerable in Laamu Atoll, Maldives: youth and children, women, the elderly, people with disabilities, displaced persons and migrants, and farmers
1	Selecting the communication channels to deliver climate change information for the coastal and small island community in Indonesia	Yoganingrum, A.; Hantoro, W.S.	Present Environment and Sustainable Development	2019	10.15551/pesd2019132007	4	Accordingly, this paper aims to select proper communication channels for disseminating information about climate change for the coastal and small islands' communities in Indonesia.
1	Challenges for shared responsibility - Political and social framing of coastal protection transformation in the Maldives	Ratter, B.; Hennig, A.; Zahid	Erde	2019	10.12854/erde-2019-426	4	In this paper we use the concept of transformative governance to identify factors in society and politics that act as barriers and enablers to the introduction of alternative approaches to coastal protection in the Maldives. We investigate how inhabitants perceive coastal erosion risks and analyse people's receptiveness to alternative coastal protection measures and their willingness to get involved in coastal protection.
2	The convention of the rights of the children (CRC), the global developmental agenda and children in Small Island Deveoping States (SIDS)	Henry-Lee, A.; Johnson-Coke, Y.	Sociological Studies of Children and Youth	2019	10.1108/S1537-466120190000024003	4	This is an opportune moment to assess the status of children in Small Island Developing States (SIDS). Using primary and secondary data, the chapter assesses the status of children after 30 years of the CRC in four Caribbean SIDs; Barbados, Jamaica, Haiti and St Lucia. The focus is on poverty, education, health and climate change related CRC articles and Sustainable Development Goals (SDGs).
2	Opinion on the Paris conference, compensation, and climate change	Attfield, R.; Beattie, M.	Electronic Green Journal	2019		4	The authors' aim is to foster among countries responsible for carbon emissions an enhanced awareness of imaginative ways in which the harms they have caused can be mitigated or ameliorated.
3	Choice of climate change adaptation strategies and associated factors: evidence from southeast Ethiopian smallholder farmers.	Hundara, M.; Endrias, G.; Guta, R.	Agricultura-Revistă de Ştiinţă şi Practică Agricolă	2019	10.15835/agrisp.v110i3-4.13408	4	The aim of this study is focusing on identification of the determinants of smallholder farmers' choice of adaptation strategies to climate change and their associated factor in southeast Ethiopia.
3	Prioritization on cultivation and climate change adaptation techniques: a potential option in strengthening climate resilience in South Africa ; Priorización de técnicas de cultivo y adaptación al cambio climático: una opción potencial para fortalecer la resiliencia climática en Sudáfrica	Oduniyi, O.S.; Antwi, M. A.; Tekana, S.S.	Agronomía Colombiana	2019	10.15446/agron.colomb.v37n1.77545	4	The study was conducted in North West Province of South Africa, to identify climate change adaptation techniques and to analyze prioritization of farmers on cultivation, both in the past and present.
3	Smallholder telecoupling and climate governance in Jambi Province, Indonesia.	Kunz, Y.; Otten, F.; Mardiana, R.; Martens, K.; Roedel, I.;Faust, H.	Scoial Sciences	2019	10.18452/20469	4	Applying this framework to case studies from Jambi province, our first case reveals that smallholder certification for so-called sustainable palm oil does not necessarily influence smallholder towards more sustainable management practices.
3	Eighth Annual Conference of inVIVO Planetary Health : From Challenges to Opportunities	Prescott, S. L.; Hancock, T.; Bland, J.; van den Bosch, M.; Jansson, J. K.; Johnson, C. C.; Wegienka, G.		2019		4	Our goal is to transform personal and planetary health through awareness, attitudes, and actions, and a deeper understanding of how all systems are interconnected and interdependent. Here, we present the abstracts and proceedings of our 8th annual conference, held in Detroit, Michigan in May 2019, themed "From Challenges, to Opportunities".
3	Environmental adaptation of upland indigenous peoples in the Philippines: basis for local resilience to climate change	Campos, M.R.A.	International Journal of Social Sciences	2019	10.20319/pijss.2019.52.928947	4	The study dealt with the literary works of Ifugaos, upland indigenous peoples in the Philippines to describe their environmental adaptation as basis for local resilience to climate change.
3	Climate change perceptions and adaptive responses of small-scale coffee farmers in Costa Rica.	Viguera, B.; Alpízar, F.; Harvey, C. A.; Martínez-Rodríguez, M. R.; Saborío-Rodríguez, M.	Agronomía Mesoamericana	2019	10.15517/am.v30i2.32905	4	The objective of this study was to describe Costa Rican small-scale coffee systems in two vulnerable agricultural landscapesand explorethe adaptation efforts that coffee farmers have implemented in these two coffee systems.
3	When climatologists meet social scientists: ethnographic speculations around interdisciplinary equivocations	Taddei, R. R.; Haines, S.	Sociologias	2019	10.1590/15174522-0215107	4	This article argues for the need to address the fact that a large amount of conflict over environmental knowledge occurs inside the academy, against the commonsensical perception that it is a mark of the relationship between science and non-science.
3	Risk, Mortality, and Memory: The Global Imaginaries of Cherie Dimaline's The Marrow Thieves, M.G. Vassanji's Nostalgia, and André Alexis's Fifteen Dogs ; Riesgo, mortalidad y memoria: los imaginarios globales de Cherie Dimaline en The Marrow Thieves, M.G. Vassanji en Nostalgia y André Alexis en Fifteen Dogs	Brydon, D.	Revista Canaria de Estudios Ingleses	2019	10.25145/j.recaesin.2019.78.07	4	This paper examines three contemporary Canadian novels that depict global risk society through a speculative fictional form that asks the question "What if?" Cherie Dimaline's The Marrow Thieves (2017) and M.G Vassanji's Nostalgia (2016) imagine dystopian worlds ravaged by climate change to critique humanist ideals of Progress. André Alexis's Fifteen Dogs (2015) uses the animal fable to address what it means to be a mortal animal.
3	Reference framework for capabilities development in agricultural innovation systems	Romero-Riaño, E.; Guarín-Manrique, L.; Dueñas-Gómez, M.; Becerra-Ardila, L.	Dyna	2019		4	The objective of this article is present a framework for AIS capability development, taking as a scientific reference, emerging economy countries experiences.
3	Priorities and interactions of Sustainable Development Goals (SDGs) with focus on wetlands	Jaramillo, F.; Desormeaux, A.; Hedlund, J.; Jawitz, J. W.; Clerici, N.; Piemontese, L.; Ählén, I.	Water	2019	10.3390/w11030619	4	We performed a network analysis to prioritize Sustainable Development Goal (SDG) targets for sustainable development in iconic wetlands and wetlandscapes around the world.
3	Personal reflections 25 years after the International Conference on Population and Development in Cairo	Gómez-Sánchez, P. I. I.	Revista Colombiana de Enfermería	2019	10.18270/rce.v18i3.2659	4	About health.
3	Socioeconomic Determinants of Banana Farmers' Perception to Climate Change in Nyeri County, Kenya.	Karienye, D.; Nduru, G.; Kamiri, H.	Journal of Arts & Humanities	2019		4	This study examined the perception of farmers in Mt Kenya region, Nyeri County-Kenya of climate change impacts on banana value chain and analysed the socio-economic factors that influenced these perceptions.
3	Cross-Chapter Box 9: Integrative Cross-Chapter Box on Low-Lying Islands and Coasts	Magnan, A.; Garschagen, M.; Gattuso, J.; Hay, J.; Hilmi, N.; Holland, E.; Van De Wal, R.	IPCC Special Report on the ocean and cryosphere in a changing climate, 657-674.	2019		10	Chapter of Book.
3	Adoption of climate-smart agricultural practices and their impact on household nutrition of smallholder farmers in Uganda	Pollyn, G. A.; Olorinnisola, A. O.; Mwongera, C.	African Journal of Sustainable Development	2019		4	This research was initiated to investigate gender disparities in the adoption of climate-smart agriculture (CSA) practices and the impact on household nutrition of smallholder farmers, using Uganda as a case study.

3	Household survey of climate change perception and adaptation strategies of smallholder coffee and basic grain farmers in Central America 2004-2014	Alpizar, F.; Harvey, C. A.; Saborío-Rodríguez, M.; Viguera, B.; Martínez-Rodríguez, M. R.;Vignola, R.	UK Data Service	2019		2	Article about coffee production
3	Assessment of afforestation activities in Embu and Kirinyaga Counties of Kenya	Owoeye, I.; Olayide, O.; Njuguna, P.	African Journal of Sustainable Development	2019		4	This study assessed afforestation activities in Embu and Kirinyaga counties in Kenya and the contributions of the Upper Tana Natural Resources Management Project (UTaNRMP) to livelihood and environmental sustainability.
1	Debates over climate change and extreme weather events: Bangladesh as a case	Haq, S.M.A.	Environmental Engineering and Management Journal	2019		8	This paper aims to reveal the debates about climate change and extreme weather events. It considers Bangladesh as a case to understand the debates, the impacts of climate change on people's livelihoods. This paper used secondary sources to select and scrutunize recent literatures about climate change, extreme events, the impacts of climate change on livelihood patterns and future trends.
1	Design options, implementation issues and evaluating success of ecologically engineered shorelines	Morris, R.L.; Heery, E.C.; Loke, L.H.L.; Lau, E.; Strain, E.M.A.; Airoldi, L.; Alexander, K.A.; Bishop, M.J.; Coleman, R.A.; Cordell, J.R.; Dong, Y.W.; Firth, L.B.; Hawkins, S.J.; Heath, T.; Kokora, M.; Lee, S.Y.; Miller, J.K.; Perkol-Finkel, S.; Rella, A.; Steinberg, P.D.; Takeuchi, I.; Thompson, R.C.; Todd, P.A.; Toft, J.D.; Leung, K.M.Y.	Oceanography And Marine Biology: An Annual Review, Vol 57	2019		8	In this review, we present an overview of current ecoengineered shoreline design options, the drivers and constraints that influence implementation and factors to consider when evaluating the success of such ecologically engineered shorelines.
1	The roles of risk aversion and climate-smart agriculture in climate risk management: Evidence from rice production in the Jianghan Plain, China	Tong, Q.M.; Swallow, B.; Zhang, L.; Zhang, J.B.	Climate Risk Management	2019	10.1016/j.crm.2019.100199	4	By investigating the effect of farmer's risk preferences, adoption of climate-smart agricultural practices and use of crop insurance on technical efficiency of rice production, this paper explores climate-smart agriculture as a strategy to cope with climate risk challenges.
1	Predictable consequences of climate change for varieties of strawberry plants grown in Morocco	Ezziyyani, M.; Hamdache, A.; Ezziyyani, M.; Cherrat, L.	International Journal Of Sustainable Agricultural Management And Informatics	2019	10.1504/IJSAMI.2019.101667	4	The cultivation of strawberry in Morocco has developed remarkably during the last 20 years. During the 2016-2017 crop year, this crop covers 3,050 hectares of land, including 180,378,742 strawberry plants imported from various varieties: Sabrina, San Andreas, Fortuna, Festival, Camarosa, Splendor and others. The period from 1990 to 2010, the dominant varieties that were grown are Chandler, OsoGrande and especially Camarosa and this thanks to its very high productivity, profitability, precocity, quality and adaptation to agroclimatic conditions of the perimeter of Luokkos. Moreover, from 2010, the Californian variety Camarosa (and others) experienced a dramatic decline. Farmers had lost patience because of low yields (very low productivity < 500 g/plant) and doubts were starting about the choice of the variety. This upset the choice of the distribution of varieties of strawberry plants imported in 2017. Today, many varieties are disappearing Moroccan producers, the choice being dictated by the production objectives.
1	Managing the wicked problem of Devils Lake flooding along the US-Canada border	Kharel, G.; Romsdahl, R.; Kirilenko, A.	International Journal Of Water Resources Development	2019	10.1080/07900627.2018.1523050	4	In this study, we define this situation as a 'wicked problem' and suggest a 'green paradiplomacy'–based framework that fosters multiactor, multiscale collaboration across jurisdictions as a management strategy.
2	Resource extraction and infrastructure threaten forest cover and community rights	Bebbington, A.J.; Bebbington, D.H.; Sauls, L.A.; Rogan, J.; Agrawal, S.; Gamboa, C.; Imhof, A.; Johnson, K.; Rosa, H.; Royo, A.; Toumbourou, T.; Verdum, R.	Proceedings of the National Academy of Sciences of the United States of America	2018	10.1073/pnas.1812505115	4	To explain the relationships among extraction, infrastructure, and forests, this paper combines a geospatial analysis of forest loss overlapped with areas of potential resource extraction, interviews with key informants, and feedback from stakeholder workshops.
2	Serbian organic food consumer research and bioeconomy development	Grubor, A.; Milicevic, N.; Djokic, N.	Sustainability (Switzerland)	2018	10.3390/su10124820	4	In this paper, results of research with the first application of a logit model in defining domestic organic food consumers are presented.
6	Reflections on the Karoo Special Issue: towards an interdisciplinary research agenda for South Africa's drylands§	Hoffman, M.T.; Walker, C.; Henschel, J.R.	African Journal of Range and Forage Science	2018	10.2989/10220119.2018.1540910	4	We begin this essay with reflections on major research themes highlighted by the Karoo Special Issue (KSI). These include concerns over land-use change, long-term monitoring, climate change, governance and the need for more interdisciplinary research. We also identify some of the novel contributions of the KSI around these themes and highlight research issues that require further attention.
6	Oceanographic flow regime and fish recruitment: Reversed circulation in the North Sea coincides with unusually strong sandeel recruitment	Henriksen, O.; Christensen, A.; Jónasdóttir, S.; MacKenzie, B.R.; Nielsen, K.E.; Mosegård, H.; Van Deurs, M.	Marine Ecology Progress Series	2018	10.3354/meps12786	4	In the present study, we demonstrate how modelled oceanographic data describing local conditions, combined with a simple probabilistic risk assessment, can be used to forecast fish recruitment. We used the lesser sandeel Ammodytes marinus in the North Sea as an example, and focussed on the circulation patterns experienced by the first-feeding larvae on the Dogger Bank.
2	Climate change adaptive capacity and smallholder farming in Trans-Mara East sub-County, Kenya	Simotwo, H.K.; Mikalitsa, S.M.; Wambua, B.N.	Geoenvironmental Disasters	2018	10.1186/s40677-018-0096-2	4	The study examined current climatic situations in Trans-Mara East sub-County, to the south-western part of Kenya, as well as the smallholders' perceptions about the situations, their adaptation levels and constraints thereof.
6	Participation, process, and partnerships: Climate change and long-term stakeholder engagement	Furman, C.; Bartels, W.-L.; Bolson, J.	Anthropology in Action	2018	10.3167/aia.2018.250301	4	In this article, we focus on the role of anthropologists as researchers and conveners in stakeholder engagement and provide a generalised overview of a long-term engagement process proceeding in three stages: (1) fact-fi nding and relationship- building; (2) incubation and collaborative learning; and (3) informed engagement and broad dissemination.
6	Assessment of the use of Participatory Integrated Climate Services for Agriculture (PICSA) approach by farmers to manage climate risk in Mali and Senegal	Dayamba, D.S.; Ky-Dembele, C.; Bayala, J.; Dorward, P.; Clarkson, G.; Sanogo, D.; Diop Mamadou, L.; Traoré, I.; Diakité, A.; Nenkam, A.; Binam, J.N.; Ouedraogo, M.; Zougmore, R.	Climate Services	2018	10.1016/j.cliser.2018.07.003	4	Recently, a new approach to extension and climate information services, namely Participatory Integrated Climate Services for Agriculture (PICSA) has been developed. PICSA makes use of historical climate records, participatory decision-making tools and forecasts to help farmers identify and better plan livelihood options that are suited to local climate features and farmers' own circumstances. This approach was implemented in 2016 in two sites in Senegal and Mali, with 57 and 47 farmers, respectively. At the end of the growing season, these farmers were surveyed to explore their perceptions on the use of the approach.
10	Climate change and financing adaptation by farmers in northern Nigeria	Abraham, T.W.; Fonta, W.M.	Financial Innovation	2018	10.1186/s40854-018-0094-0	3	Does not mention smallholders. This paper examines farmers' perceptions of their exposure to climate change in rural northern Nigeria.
10	Farmers' perceptions on cultivation and the impacts of climate change on goods and services provided by Garcinia kola in Nigeria	Agwu, O.P.; Bakayoko, A.; Jimoh, S.O.; Stefan, P.	Ecological Processes	2018	10.1186/s13717-018-0147-3	3	Does not mention smallholders. The study investigated cultivation and farmers' perceptions on the impacts of climate change on goods and services provided by G. kola in Nigeria.

2	Livelihood Dynamics Across a Variable Flooding Regime	King, B.; Yurco, K.; Young, K.R.; Crews, K.A.; Shinn, J.E.; Eisenhart, A.C.	Human Ecology	2018	10.1007/s10745-018-0039-2	4	This paper details research conducted from 2011 to 2016 in five villages located in different locations within the Okavango Delta of Botswana. We report the findings from qualitative interviewing and livelihood mapping activities that are integrated with remote sensing analysis to provide concrete empirical detail on the variability of flooding and resulting variations in perception and livelihood responses.
12	Recognizing and reducing barriers to science and math education and STEM careers for native hawaiians and pacific islanders	Kerr, J.Q.; Hess, D.J.; Smith, C.M.; Hadfield, M.G.	CBE Life Sciences Education	2018	10.1187/cbe.18-06-0091	4	To understand the reasons why low numbers of Native Hawaiians and Pacific Islanders enter colleges, enroll in science, technology, engineering, and mathematics (STEM) courses, or undertake life sciences/STEM careers, 25 representatives from colleges and schools in seven U.S.-affiliated states and countries across the Pacific participated in a 2-day workshop.
6	Human-climate induced drivers of mountain grassland over the last 40 years in Sidama, Ethiopia: perceptions versus empirical evidence	Debeko, D.; Angassa, A.; Abebe, A.; Burka, A.; Tolera, A.	Ecological Processes	2018	10.1186/s13717-018-0145-5	4	Using satellite imagery, we studied land use/land cover (LULC) patterns between 1973 and 2015.
6	Perceptions of mountainous people on climate change, livelihood practices and climatic shocks: A case study of Swat District, Pakistan	Ullah, H.; Rashid, A.; Liu, G.; Hussain, M.	Urban Climate	2018	10.1016/j.uclim.2018.10.003	3	Does not mention smallholders, rural, small scale. Random sampling method was followed to conduct household survey, a total of 279 households were interviewed from rural mountainous areas of Swat District (Pakistan).
6	Assessment of Climate Change Impacts and its Implications on Medicinal Plants-Based Traditional Healthcare System in Central Himalaya, India	Maikhuri, R.K.; Phondani, P.C.; Dhyani, D.; Rawat, L.S.; Jha, N.K.; Kandari, L.S.	Iranian Journal of Science and Technology, Transaction A: Science	2018	10.1007/s40995-017-0354-2	4	The present study emphasizes that persistence of climatic variability will change the habitat and population of medicinal plants in the Himalayan region. The study reported 15 high-value medicinal plants which are used by the local people for curing various ailments.
6	Community perceptions of socioecological stressors and risk-reducing strategies in Tabasco, Mexico	Pischke, E.C.; Azahara Mesa-Jurado, M.; Eastmond, A.; Abrams, J.; Halvorsen, K.E.	Journal of Environmental Studies and Sciences	2018	10.1007/s13412-018-0493-6	3	This research draws on qualitative interview data to examine resident perceptions of water-related socioecological and climatic changes and potential risk-reducing strategies within small rural communities in Tabasco, Mexico.
26	Responses of sub-Saharan smallholders to climate change: Strategies and drivers of adaptation	García de Jalón, S.; Iglesias, A.; Neumann, M.B.	Environmental Science and Policy	2018	10.1016/j.envsci.2018.09.013	4	This paper explores how adaptation strategies are adopted by small-holders in sub-Saharan Africa as a function of their adaptive capacity.
6	Cleaner and greener livestock production: Appraising producers' perceptions regarding renewable energy in Iran	Bozorgparvar, E.; Yazdanpanah, M.; Forouzani, M.; Khosravipour, B.	Journal of Cleaner Production	2018	10.1016/j.jclepro.2018.08.280	4	This paper aims to use a comprehensive modeling framework to investigate the intention of Iranian livestock producers to deploy renewable energies on their farms to mitigate climate change.
6	Livelihood exposure to climatic stresses in the north-eastern floodplains of Bangladesh	Rahman, H.M.T.; Mia, M.E.; Ford, J.D.; Robinson, B.E.; Hickey, G.M.	Land Use Policy	2018	10.1016/j.landusepol.2018.08.015	4	In this paper, we seek to better understand the temporal and spatial aspects of climatic stress on local resource production systems and resource-use behaviors by including the perspectives of resource-dependent communities . Field research was conducted over a nine-month period in the remote north-eastern floodplain communities of Bangladesh. A climatic event appeared as a stress to livelihood sustainability when it happened in an untimely manner (e.g., flooding during resource harvesting periods) and directly affected the production process (e.g., agriculture and fisheries).
2	Effect of marine protected areas and macroeconomic environment on meat consumption in SEAFO countries	Simo-Kengne, B.D.; Dikgang, J.; Ofstad, S.P.	Agricultural and Food Economics	2018	10.1186/s40100-018-0105-5	4	This paper investigates the role of marine reserves in shaping meat consumption pattern across member countries of the South East Atlantic Fisheries Organisation (SEAFO) for the period 1990 to 2009. Using a panel data including economic factors, life expectancy and environmental awareness, we find that meat consumption is positively associated with the presence of marine protected areas (MPAs). T
6	The implications of rural perceptions of water scarcity on differential adaptation behaviour in Rajasthan, India	Singh, C.; Osbahr, H.; Dorward, P.	Regional Environmental Change	2018	10.1007/s10113-018-1358-y	3	This paper revisits existing frameworks that conceptualise perceptions of environmental risk and decision-making, and uses empirical evidence from an in-depth study conducted in Rajasthan, India, to emphasise how individual and collective memories, and experience of past extreme events shape current definitions and future expectations of climatic risks.
2	Direct conversion of an agricultural solid waste to hydrocarbon gases via the pyrolysis technique	Moneim, M.A.; El Naggar, A.M.A.; El Sayed, H.A.; Mostafa, M.S.; Khalil, N.M.; Hassan, M.E.D.	Egyptian Journal of Petroleum	2018	10.1016/j.ejpe.2018.03.008	4	The current research work focuses on the conversion of rice straw (a biomass-based solid waste) into hydrocarbon gases in general and methane (main constituent of natural gas) in particular.
6	Perceived effects of transhumant practices on natural resource management in southern Mali	Umutoni, C.; Ayantunde, A.A.	Pastoralism	2018	10.1186/s13570-018-0115-7	4	In this paper, we present how various actors in two districts in the Sudano-Sahelian/Sudano-Guinea zones of Mali perceived the effect of transhumant practices on natural resource management.
6	Socio-ecological vulnerability assessment in coastal communities in the BCLME region	Sowman, M.; Raemaekers, S.	Journal of Marine Systems	2018	10.1016/j.jmarsys.2018.01.008	4	This paper reports on a community-based rapid vulnerability assessment (RVA) methodology developed and applied in eight small-scale fishing communities in the Benguela Current Large Marine Ecosystem region. This participatory methodology was designed to be applied in a workshop setting and draws on the observations, perceptions and local knowledge of fishers in order to better understand the extent to which their livelihoods are susceptible to various socio-ecological changes and their ability to respond to these changes.
6	Quantifying climate change induced threats to wetland fisheries: a stakeholder-driven approach	Naskar, M.; Roy, K.; Karnatak, G.; Nandy, S.K.; Roy, A.	Environment, Development and Sustainability	2018	10.1007/s10668-017-0018-6	4	The article presents a stakeholder-driven approach to quantify the impacts of climate change on wetland fisheries
10	Local tree knowledge can fast-track agroforestry recommendations for coffee smallholders along a climate gradient in Mount Elgon, Uganda	Gram, G.; Vaast, P.; van der Wolf, J.; Jassogne, L.	Agroforestry Systems	2018	10.1007/s10457-017-0111-8	4	The objectives of this research were to develop agroforestry species recommendations and tailor these to the farmers' needs and local context, taking into consideration gender.
10	Cocoa and climate change: Insights from smallholder cocoa producers in Ghana regarding challenges in implementing climate change mitigation strategies	Ameyaw, L.K.; Ettl, G.J.; Leissle, K.; Anim-Kwapong, G.J.	Forests	2018	10.3390/f9120742	3	This study investigates the knowledge and perception of smallholder cocoa farmers on the potential impacts of climate change on cocoa production in Ghana.
2	Understanding smallholder farmers' capacity to respond to climate change in a coastal community in Central Vietnam	Phuong, L.T.H.; Biesbroek, G.R.; Sen, L.T.H.; Wals, A.E.J.	Climate and Development	2018	10.1080/17565529.2017.1411240	4	This paper aims to explore smallholder farmers' capacity to respond to climate change in current and future agricultural production.
6	Exploring the consumer attitude of building-attached photovoltaic equipment using revised technology acceptance model	Tsaur, R.-C.; Lin, Y.-H.	Sustainability (Switzerland)	2018	10.3390/su10114177	4	This study defined a solar-energy building as a Building-Attached Photovoltaic (BAPV) system in which the solar modules can be attached to and detached from the building without any structural damage; then, we proposed the Technology Acceptance Model (TAM) to forecast and explain public acceptance of BAPV. Last, we explored consumers' intentions to use the BAPV systems and their purchasing behavior.

2	Empirical study of the Environmental Kuznets curve and Environmental Sustainability curve hypothesis for Australia, China, Ghana and USA	Sarkodie, S.A.; Strezov, V.	Journal of Cleaner Production	2018	10.1016/j.jclepro.2018.08.039	4	This study examines Environmental Kuznets and Environmental Sustainability curve hypotheses for Australia, China, Ghana and the USA from 1971 to 2013 in order to examine the factors contributing to adverse greenhouse gas emission and economic impacts relative to their development.
16	Smallholder farmers livestock production on the face of climate change in Bahir Dar, Zuria district, northwestern Ethiopia	Asmare, B.; Meheret, F.	Biodiversitas	2018	10.13057/biodiv/d190642	4	The objective of the study was to assess the livestock production and marketing system in smallholder systems of the area Bahir Dar Zuria district.
11	How climate awareness influences farmers' adaptation decisions in Central America?	de Sousa, K.; Casanoves, F.; Sellare, J.; Ospina, A.; Suchini, J.G.; Aguilar, A.; Mercado, L.	Journal of Rural Studies	2018	10.1016/j.jrurstud.2018.09.018	3	Does not mention smallholders. Farmers were located across the two main ecoregions of Central America (Fig. 1): the Central American Dry Corridor (or Dry Forests), corresponding to El Salvador, Guatemala, Honduras, and part of Nicaragua (districts of Jinotega and Matagalpa); and the Central American Rainforests in Nicaragua (districts of Jinotega, Matagalpa, and Atlántico Norte).
6	Gender and Adaptation to Climate Change: Perspectives from a Pastoral Community in Gujarat, India	Venkatasubramanian, K.; Ramnarain, S.	Development and Change	2018	10.1111/dech.12448	4	The mechanisms used by these communities to confront socio-economic and institutional limitations to climate adaptation remain relatively unexamined. Second, not much is known about pastoral women's perceptions of climate adaptation and coping. This article examines the socially situated perspective of women in the Maldhari pastoral community in Gujarat, Western India.
6	Using practitioner knowledge to expand the toolbox for private lands conservation	Bennett, D.E.; Pejchar, L.; Romero, B.; Knight, R.; Berger, J.	Biological Conservation	2018	10.1016/j.biocon.2018.09.003	4	Here, we surveyed practitioners in the United States to gauge their familiarity with seven approaches to private lands conservation in different landscape contexts. Most practitioners were familiar with only two conservation tools, conservation easements and direct payment programs (e.g., Farm Bill programs), and familiarity varied among different types of organizations.
26	Regional and sectoral assessment on climate-change in Pakistan: Social norms and indigenous perceptions on climate-change adaptation and mitigation in relation to global context	Hussain, M.; Liu, G.; Yousaf, B.; Ahmed, R.; Uzma, F.; Ali, M.U.; Ullah, H.; Butt, A.R.	Journal of Cleaner Production	2018	10.1016/j.jclepro.2018.07.272	6	We conducted a survey to explore the adaptation and mitigation alertness to climate change among all provinces and areas (urban, peri-urban and rural) of Pakistan from general public since they are directly affected by climate change.
2	Design of spatial PGIS-MCDA-based land assessment planning for identifying sustainable land-use adaptation priorities for climate change impacts	Jeong, J.S.	Agricultural Systems	2018	10.1016/j.agsy.2018.09.001	4	This article presents an assessment framework for exploring climate change impacts using participatory geographic information systems (PGISs)-multi-criteria decision analysis (MCDA) spatial planning with the preference ranking organization method for enrichment of evaluations (PROMETHEE) in sustainable land-use adaptation.
6	Aquaponics in South Africa: Results of a national survey	Mchunu, N.; Lagerwall, G.; Senzanje, A.	Aquaculture Reports	2018	10.1016/j.aqrep.2018.08.001	4	This study was conducted in 2016 using an online survey questionnaire to collect information about the types of systems used, the management and distribution of aquaponics in South Africa
6	Perceptions of multi-stresses impacting livelihoods of marine fishermen	Malakar, K.; Mishra, T.; Patwardhan, A.	Marine Policy	2018	10.1016/j.marpol.2018.08.029	4	This study, first, identifies the specific stresses impacting livelihoods of the fishing community in Maharashtra (India) through the literature and Focus Group Discussions. Thereafter, a household survey is used to examine the factors influencing the perceptions of these stresses.
2	Land use and land cover changes and the link to land degradation in Arsi Negele district, Central Rift Valley, Ethiopia	Mekonnen, Z.; Tadesse, H.; Woldeamanuel, T.; Asfaw, Z.; Kassa, H.	Remote Sensing Applications: Society and Environment	2018	10.1016/j.rsase.2018.07.012	4	The objectives of this study were to assess: (i) the extent of LULCC and normalized difference vegetation index (NDVI) and the link to land degradation; (ii) the causes of LULCC and implication for climate change adaptation.
6	UK public perceptions of Ocean Acidification – The importance of place and environmental identity	Spence, E.; Pidgeon, N.; Pearson, P.	Marine Policy	2018	10.1016/j.marpol.2018.04.006	3	As there has been little research conducted to examine public risk perceptions of this issue, the aim was to explore this through a survey (N = 954) carried out in the UK. The survey explored a range of psychological factors including concern, place attachment, and environmental identity that are known to influence risk perceptions
6	Farmers as climate citizens	Flemsæter, F.; Bjørkhaug, H.; Brobakk, J.	Journal of Environmental Planning and Management	2018	10.1080/09640568.2017.1381075	4	This article explores the potential for farmers to become climate citizens.
10	Multiple non-climatic drivers of food insecurity reinforce climate change maladaptation trajectories among Peruvian Indigenous Shawi in the Amazon	Zavaleta, C.; Berrang-Ford, L.; Ford, J.; Llanos-Cuentas, A.; Cárcamo, C.; Ross, N.A.; Lancha, G.; Sherman, M.; Harper, S.L.	PLoS ONE	2018	10.1371/journal.pone.0205714	4	This paper characterizes the food system of the Shawi of the Peruvian Amazon, climatic and non-climatic drivers of their food security vulnerability to climate change, and identifies potential maladaptation trajectories.
6	Impact of climate-change risk-coping strategies on livestock productivity and household welfare: empirical evidence from Pakistan	Rahut, D.B.; Ali, A.	Heliyon	2018	10.1016/j.heliyon.2018.e00797	4	Using the primary datasets collected from 700 livestock farmers from all four major provinces of Pakistan and Azad Jammu and Kashmir (AJK) and Gilgit Baltistan, this paper analyzes the impact of climate-change risk coping strategies on household welfare.
6	Simulating agricultural land-use adaptation decisions to climate change: An empirical agent-based modelling in northern Ghana	Amadou, M.L.; Villamor, G.B.; Kyei-Baffour, N.	Agricultural Systems	2018	10.1016/j.agsy.2017.10.015	4	The aim of this article is to examine local agricultural adaptation to climate change and variability in a semi-arid area of the Upper East Region of Ghana. This is performed by integrating the two-step decision making sub-models, Perception-of-Climate-Change and Adaptation-Choice-Strategies, to the Land Use Dynamic Simulator (LUDAS).
6	Socio-ecological adaptation to Early-Holocene sea-level rise in the western Mediterranean	Brisset, E.; Burjachs, F.; Ballesteros Navarro, B.J.; Fernández-López de Pablo, J.	Global and Planetary Change	2018	10.1016/j.gloplacha.2018.07.016	4	We explored how coastal mutations have affected ancient human systems in the western Mediterranean. The Pego-Oliva basin (Spain) provides a thick sediment sequence located in proximity to two well-studied Mesolithic and Neolithic archaeological sites. Based on 16 sediment cores, sedimentological analyses, 14C dates, and integration of previous works, we reconstructed the architecture of the sedimentary facies and the chronology of deposition for the last 9500 years. F
6	Recreational fishers' support for no-take marine reserves is high and increases with reserve age	Navarro, M.; Kragt, M.E.; Hailu, A.; Langlois, T.J.	Marine Policy	2018	10.1016/j.marpol.2018.06.021	4	In this study, recreational fishers were surveyed in ten Australian marine parks to determine levels of support and beliefs about the benefits and costs of no-take marine reserves.
2	Are shrimp farmers actual gamblers? An analysis of risk perception and risk management behaviors among shrimp farmers in the Mekong Delta	Joffre, O.M.; Poortvliet, P.M.; Klerkx, L.	Aquaculture	2018	10.1016/j.aquaculture.2018.06.012	4	The objective of this paper is to analyze the case of shrimp farming in Vietnam's Mekong Delta, where different types of shrimp farms (extensive, semi-intensive and intensive) co-exist within the same landscape, to identify the underlying factors driving stocking behavior and the adoption of different risk management strategies.
2	Nutrient inputs and hydrology together determine biogeochemical status of the Loire River (France): Current situation and possible future scenarios	Garnier, J.; Ramarson, A.; Billen, G.; Théry, S.; Thiéry, D.; Thieu, V.; Minaudo, C.; Moatar, F.	Science of the Total Environment	2018	10.1016/j.scitotenv.2018.05.045	4	The Grafs-Seneque/Riverstrahler model was implemented for the first time on the Loire River for the 2002–2014 period, to explore eutrophication after improvement of wastewater treatments. The model reproduced the interannual levels and seasonal trends of the major water quality variables.
6	A framework to investigate drivers of adaptation decisions in marine fishing: Evidence from urban, semi-urban and rural communities	Malakar, K.; Mishra, T.; Patwardhan, A.	Science of the Total Environment	2018	10.1016/j.scitotenv.2018.04.429	6	Based on previous literature and focus group discussions with community, this study identifies few prominent adaptation responses in marine fishing and proposes credible factors driving decisions to adopt them. This statistical analysis is based on 601 responses collected across three regional fishing groups: urban, semi-urban and rural.

6	Irrigation water management in Iran: Implications for water use efficiency improvement	Nazari, B.; Liaghat, A.; Akbari, M.R.; Keshavarz, M.	Agricultural Water Management	2018	10.1016/j.agwat.2018.06.003	4	Using the strengths, weaknesses, opportunities and threats/political, economic, social, technological, legal and environmental (SWOT/PESTLE) analysis, this paper explores 40 internal and external factors that influence irrigation water management in Iran and recognizes legal, social, technological and political dynamics as the major reasons for failure of irrigation water management in the country.
2	Application of the multiple criteria decision-making (MCDM) approach in the identification of Carbon Footprint reduction actions in the Brazilian beef production chain	Florindo, T.J.; Florindo, G.I.B.D.M.; Talamini, E.; Costa, J.S.S.; Léis, C.M.M.; Tang, W.Z.; Schultz, G.; Kulay, L.; Pinto, A.T.; Ruviaro, C.F.	Journal of Cleaner Production	2018	10.1016/j.jclepro.2018.06.116	4	In this context, the aim of this study was to rank possible improvement actions that allow the reduction of the Carbon Footprint originated from Brazilian beef exports considering multiple criteria, from the identification of the impact profile associated with the final product.
11	Hydro-climatic stress, shallow groundwater wells and coping in Ghana's White Volta basin	Dovie, D.B.K.; Kasei , R.A.	Science of the Total Environment	2018	10.1016/j.scitotenv.2018.04.416	4	Therefore, using the Water Evaluation And Planning (WEAP) model and qualitative techniques, the implications of groundwater recharge and surface runoff in their orientation to shallow wells is explored.
6	The environmental footprint of an organic peri-urban orchard network	Martinez, S.; del Mar Delgado, M.; Marin, R.M.; Alvarez, S.	Science of the Total Environment	2018	10.1016/j.scitotenv.2018.04.340	4	This study applied the environmental extended multi-regional input-output analysis to obtain the Environmental Footprint associated with an organic peri-urban orchard network in Spain.
6	Regulatory uncertainty around new breeding techniques	Lassoued R.; Smyth S.J.; Phillips P.W.B.; Hesseln H.;	Frontiers in Plant Science	2018	10.3389/fpls.2018.01291	4	Using survey data, we report results from an international panel of experts regarding the institutional and social barriers that might impede the development of new plant technologies.
6	Do farmer, household and farm characteristics influence the adoption of sustainable practices? The evidence from the Republic of Moldova	Pilarova, T.; Bavorova, M.; Kandakov, A.	International Journal of Agricultural Sustainability	2018	10.1080/14735903.2018.1499244	4	To provide a more comprehensive understanding of the determinants and barriers influencing the adoption of conservation agriculture practices, an analytic framework combining both binary and ordered probit models addressing the potential endogeneity of variables was applied.
6	Dancing climate on a high mountain	Tai, J.	Research in Dance Education	2018	10.1080/14647893.2018.1523381	4	This article discusses how the children discovered new aspects of their personalities, anxieties and unspoken habitus during their exercises of dance and play.
6	Farmers' willingness to adapt to climate change for sustainable water resources management: A case study of Tunisia	Lasram, A.; Dellagi, H.; Dessalegn, B.; Dhehibi, B.; Mechlia, N.B.	Journal of Water and Climate Change	2018	10.2166/wcc.2018.171	4	This study provides valuable insights into the conditions that can promote farmers' acceptance of regulated deficit irrigation and a new water pricing policy to address CC impacts on the semi-arid irrigated region which will allow for a sustainable irrigation regime and the conservation of water resources at regional scale.
6	Transforming agriculture to climate change in Famenin County, West Iran through a focus on environmental, economic and social factors	Khanian, M.; Marshall, N.; Zakerhaghighi, K.; Salimi, M.; Naghdi, A.	Weather and Climate Extremes	2018	10.1016/j.wace.2018.05.006	4	We examine how the perception of farmers to transformational change is influenced by social, environmental and economic factors in six villages within the Famenin County of western Iran, which have experienced a notable recent decrease in groundwater levels, an increase in temperature due to reduced rainfall and no support from government.
10	Livelihoods on the edge without a safety net: The case of smallholder crop farming in north-central Namibia	Spear, D.; Chappel, A.	Land	2018	10.3390/land7030079	4	Semi-structured interviews were conducted in three villages in Onesi constituency to examine what agricultural practices smallholder crop farmers use, perception of changes in their yields, their perspective on future yields and whether they are planning on changing their agricultural practices.
6	Enhancing adaptive capacities in coastal communities through engaged communication research: Insights from a statewide study of shellfish co-management	McGreavy, B.; Randall, S.; Quiring, T.; Hathaway, C.; Hillyer, G.	Ocean and Coastal Management	2018	10.1016/j.ocecoaman.2018.06.016	4	In this paper, we demonstrate how engaged communication research can help foster adaptive capacities to enhance the resilience of these systems. We describe perceptions of problems and successes in co-management, as awareness of problem constructions is essential for identifying the ways in which communication shapes adaptive responses.
2	Environmental and sustainability evaluation of livestock waste management practices in Cyprus	Lijó, L.; Frison, N.; Fatone, F.; González-García, S.; Feijoo, G.; Moreira, M.T.	Science of the Total Environment	2018	10.1016/j.scitotenv.2018.03.299	4	The aim of this study was to compare the environmental performance and sustainability of different management options for livestock waste in Cyprus.
6	Integration of water management and land consolidation in rural areas to adapt to climate change: Experiences from Poland and the Netherlands	Stańczuk-Galwiaczek, M.; Sobolewska-Mikulska, K.; Ritzema, H.; van Loon-Steensma, J.M.	Land Use Policy	2018	10.1016/j.landusepol.2018.06.005	4	This paper investigates the history of and approaches to land consolidation and water management in Poland and the Netherlands, and illustrates the integration of land consolidation and water management to realize a multifunctional climate resilient rural area by two examples in each country.
6	Ocean futures: Exploring stakeholders' perceptions of adaptive capacity to changing marine environments in Northern Norway	Tiller, R.; Richards, R.	Marine Policy	2018	10.1016/j.marpol.2018.04.001	4	This article contributes to advances in climate change research by exploring, within the context of the results of the viewExposed program for assessing Integrated Vulnerabilities in different municipalities in Norway, to what extent stakeholders in different industries are willing to accept, or expect to be able to adapt to, these new realities. This was investigated through stakeholder driven workshops with stakeholders from maritime industries, commercial fisheries, tourism and aquaculture in Norway using the conceptual modeling tools of systems thinking and Bayesian Belief Networks.
2	Assessment of antibody assay methods in determination of prevalence of infectious bursal disease among local chickens and guinea fowls in Kwara state, North Central Nigeria	Daodu, O.B.; Oludairo, O.O.; Aiyedun, J.O.; Ambali, H.M.; Kadir, R.A.; Daodu, O.C.; Olorunshola, I.D.; Adah, A.D.	Veterinary World	2018	10.14202/vetworld.2018.1183-1187	4	This study aimed to assess available assay methods for infectious bursal disease (IBD) diagnosis and seromonitoring in local birds.
6	The 'invisible' subsoil: An exploratory view of societal acceptance of subsoil management in Germany	Frelih-Larsen, A.; Hinzmann, M.; Ittner, S.	Sustainability (Switzerland)	2018	10.3390/su10093006	4	Drawing on in-depth interviews with farmers and stakeholders in Germany, we show that biophysical conditions, the timing of operations, economic considerations, and awareness of subsoil functions are key factors in the acceptance of management methods. Views towards methods involving mechanical intervention are more diverse and in some cases more critical because the benefits are not always certain, the costs can outweigh the benefits, and/or because they entail risks for soil structure and functions.
16	Climate change impacts and adaptation among smallholder farmers in Central America	Harvey, C.A.; Saborio-Rodríguez, M.; Martinez-Rodríguez, M.R.; Viguera, B.; Chain-Guadarrama, A.; Vignola, R.; Alpizar, F.	Agriculture and Food Security	2018	10.1186/s40066-018-0209-x	3	We surveyed 860 smallholder coffee and basic grain (maize/bean) farmers.
6	Smallholder farmers' participation in climate change adaptation programmes: understanding preferences in Nepal	Khanal, U.; Wilson, C.; Lee, B.; Hoang, V.-N.	Climate Policy	2018	10.1080/14693062.2017.1389688	4	This study empirically investigates Nepalese farmers' willingness to support the implementation of adaptation programmes.
2	Emotions, attitudes, and appraisal in the management of climate-related risks by fish farmers in Northern Thailand	Lebel, L.; Lebel, P.	Journal of Risk Research	2018	10.1080/13669877.2016.1264450	4	The objective of this study was to enhance understanding of the interactions between attitudes, analysis, and emotions in making risk decisions.
6	Coping with and adapting to climate change: A gender perspective from smallholder farming in Ghana	Assan, E.; Suvedi, M.; Olabisi, L.S.; Allen, A.	Environments - MDPI	2018	10.3390/environments5080086	4	Using key informant interviews, household surveys, and focus group discussions, we address these gaps by exploring coping and adaptation measures adopted by heads of farm households to counter climate change impacts on their livelihood activities and household well-being in the Guinea Savanna agroecological zone in Ghana. Additionally, we assessed the preferred institutional adaptation support of heads of farm households in adapting to future projected impacts.

6	Analysis of economic and social costs of growing Petunia × Hybrida in a greenhouse production system using alternative containers	Brumfield, R.G.; Kenny, L.B.; Devincentis, A.J.; Koeser, A.K.; Verlinden, S.; Both, A.J.; Bi, G.; Lovell, S.T.; Stewart, J.R.	HortScience	2018	10.21273/HORTSCI13044-18	4	This study calculates the variability of direct costs of production using alternative containers to offer a comparison of social and economic costs. We evaluated these direct costs of producing petunia (Petunia3hybrida) grown in pots made of traditional plastic, bioplastic, coir, manure, peat, bioplastic sleeve, slotted rice hull, solid rice hull, straw, wood fiber, and recycled reground plastic containers used in a previous assessment of GWP.
6	Climate variability impacts on rice production in the Philippines	Stuecker, M.F.; Tigchelaar, M.; Kantar , M.B.	PLoS ONE	2018	10.1371/journal.pone.0201426	4	Here we explore the impact of climate variability on rice yield and production in the Philippines from 1987–2016 in both irrigated and rainfed production systems at various scales.
6	Adoption level, yield and constraints in Indian barley (Hordeum vulgare) cultivation: Insights from baseline data for identifying livelihood prospects	Sendhil, R.; Singh, R.; Kumar, A.; Chand, R.; Pandey, J.K.; Singh, R.; Ravindran; Kharub, A.S.; Verma, R.P.S.	Indian Journal of Agricultural Sciences	2018		4	A baseline study was conducted (2013-14 and 2014-15) to analyse the extent of adoption, yield variations and constraints in cultivation across four major states, viz. Haryana, Madhya Pradesh, Rajasthan and Uttar Pradesh so as to identify the livelihood options and explore possibilities for increasing the crop acreage.
6	Simultaneous adoption of integrated soil fertility management technologies in the Chinyanja Triangle, Southern Africa	Mponela, P.; Kassie, G.T.; Tamene, L.D.	Natural Resources Forum	2018	10.1111/1477-8947.12155	4	This study aimed at identifying the key determinants that govern farmers' decisions to adopt multiple components of integrated soil fertility management (ISFM) in a maize mixed cropping system of the Chinyanja Triangle, Southern Africa.
6	Participation and Perception Towards Changing Farming Practices in Eastern India: A Study of Women Headed Households	Meena, M.S.; Singh, K.M.; Meena, H.M.	National Academy Science Letters	2018	10.1007/s40009-018-0656-8	4	The study measures the participation and perception of rural women towards change in agricultural farming practices in changing climate context.
2	Sugar-energy sector vulnerability under CMIP5 projections in the Brazilian central-southern macro-region	Zullo, J.; Pereira, V.R.; Koga-Vicente, A.	Climatic Change	2018	10.1007/s10584-018-2249-4	4	The main aim here is to identify SES vulnerability under climate change conditions, based on the methodology used by the Agricultural Zoning of Climatic Risks (ZARC) program. We assessed changes of the sugarcane ZARC in light of the current and near-future climatic conditions given by eight general circulation models (GCM) of the 5th IPCC report and under the representative concentration pathway (RCP) 8.5.
6	Women's participation in environmental decision-making: Quasi-experimental evidence from northern Kenya	Grillos, T.	World Development	2018	10.1016/j.worlddev.2018.03.017	4	Increased participation by women in decision-making thus promises to offer a win–win solution: greater gender equality as well as enhanced resilience to persistent drought. This quasi-experimental study evaluates an intervention that aimed to increase drought preparedness in northern Kenyan pastoralist communities through the empowerment of women at the household and community levels.
6	Benefits of adapting to sea level rise: the importance of ecosystem services in the French Mediterranean sandy coastline	Hérivaux, C.; Rey-Valette, H.; Rulleau, B.; Agenais, A.-L.; Grisel, M.; Kuhfuss, L.; Maton, L.; Vinchon, C.	Regional Environmental Change	2018	10.1007/s10113-018-1313-y	4	This article proposes an innovative approach to assess the benefits of adapting to sea level rise (SLR) in a coastal area on a regional scale.
6	Monsoonal Forcing of European Ice-Sheet Dynamics During the Late Quaternary	Kaboth-Bahr, S.; Bahr, A.; Zeeden, C.; Toucanne, S.; Eynaud , F.; Jiménez-Espejo, F.; Röhl, U.; Friedrich, O.; Pross, J.; Löwemark, L.; Lourens, L.J.	Geophysical Research Letters	2018	10.1029/2018GL078751	4	Here we show that the advection of subtropical water toward the continental margin of western Europe lead to enhanced moisture availability on the continent and fueled the growth of EIS lobes during glacials.
6	The impact of psychological factors on farmers' intentions to reuse agricultural biomass waste for carbon emission abatement	Jiang, L.; Zhang, J.; Wang, H.H.; Zhang, L.; He, K.	Journal of Cleaner Production	2018	10.1016/j.jclepro.2018.04.040	4	This paper uses the theory of planned behavior, a typical social psychology model, to identify the psychological constructs that affect farmers' intentions to reuse agricultural biomass waste for carbon emission abatement.
6	The challenge of integrated flood risk governance: case studies in Alberta and Saskatchewan, Canada	Hurlbert, M.	International Journal of River Basin Management	2018	10.1080/15715124.2018.1439495	4	This is an institutional study of the policy instruments that respond to flood for agricultural producers and their community. Two case studies in Saskatchewan and Alberta, Canada were conducted through a review of secondary sources and semi-structured qualitative interviews to assess instruments based on the perceptions of agricultural producers and people involved in flood governance.
6	Assessing the potential for small-scale aquaculture in Cambodia	Richardson, R.B.; Suvedi, M.	Environments - MDPI	2018	10.3390/environments5070076	4	The objective of this study is to examine perceptions of small-scale aquaculture by participants in this program in order to assess the potential for aquaculture to contribute to household food security and conservation of the Tonle Sap Lake ecosystem.
6	Improving Representation of Crop Growth and Yield in the Dynamic Land Ecosystem Model and Its Application to China	Zhang, J.; Tian, H.; Yang, J.; Pan, S.	Journal of Advances in Modeling Earth Systems	2018	10.1029/2017MS001253	4	In this study, a process-based agricultural module has been coupled with the Dynamic Land Ecosystem Model (DLEM-AG2.0) for assessing how multiple environmental factors (climate change, atmospheric CO2 concentration, tropospheric O3, and nitrogen deposition) and human activities (land use/cover change, nitrogen fertilizer use, and irrigation) have affected the crop growth, development, yield, carbon (C), nitrogen (N), and water cycles in agroecosystems.
10	The Impact of Fair Trade on Smallholders' Capacity to Adapt to Climate Change	Borsky, S.; Spata, M.	Sustainable Development	2018	10.1002/sd.1712	4	The aim of this paper is to assess to what extent producers' participation in fair trade can increase their adaptive capacity and make them more resilient to climate change.
6	History, hydrology and hydraulics: Rethinking the ecological management of large rivers	Mallen-Cooper, M.; Zampatti, B.P.	Ecohydrology	2018	10.1002/eco.1965	4	The mythology of the Murray River in Australia is that over 100 years ago, it naturally "dried to a series of pools" in drought; therefore, the biota are flexible and adapted to hydrological variability and lentic habitats. Analysis of historical and modelled hydrology and hydrodynamics, however, demonstrates that: (a) cease-to-flow events were not natural and were instead caused by multiple small-scale irrigation diversions; and (b) the Murray River had widespread perennial lotic habitats.
6	Independent data for transparent monitoring of greenhouse gas emissions from the land use sector – What do stakeholders think and need?	Romijn, E.; De Sy, V.; Herold, M.; Böttcher, H.; Roman-Cuesta, R.M.; Fritz, S.; Schepaschenko, D.; Avitabile, V.; Gaveau, D.; Verchot, L.; Martius, C.	Environmental Science and Policy	2018	10.1016/j.envsci.2018.03.016	4	Through an online survey, we investigated stakeholders' data needs for estimating forest area and change, forest biomass and emission factors, and AFOLU GHG emissions.
6	Micro-level perception to climate change and adaptation issues: A prelude to mainstreaming climate adaptation into developmental landscape in India	Singh, N.P.; Anand, B.; Khan, M.A.	Natural Hazards	2018	10.1007/s11069-018-3250-y	3	Does not mention smallholders. In this paper, the grass-root level perspectives on climate change impacts and adaptation decisions were elicited at farm level in the Moga district of Punjab and Mahbubnagar district of Telangana, India.
2	Agricultural feedstocks of two Brassica oilseed crops and energy cogeneration with pure vegetable oil for a sustainable short agro-energy chain in Sicily (Italy)	Licata, M.; La Bella, S.; Lazzeri, L.; Matteo, R.; Leto, C.; Massaro, F.; Tuttolomondo, T.	Industrial Crops and Products	2018	10.1016/j.indcrop.2018.02.032	4	This paper focused on testing and awareness raising of biofuel production for the cogeneration of electricity and heat from PVO of two Brassica oilseed crops in Sicily (Italy).
2	Interest in and awareness of French President Emmanuel Macron's	Dadural, J.S.; Reznikov, L.R.	Social Science	2018	10.3390/socsci7070102	3	President Donald Trump's withdrawal from the Paris Agreement served as an impetus for the French President to enact "Make our Planet Great Again", an initiative aimed at attracting international scientists to study climate change. In the current study, we evaluated the extent of interest and awareness towards this initiative. Our goal was to determine factors that impacted awareness and interest, with the hypothesis that political views and beliefs towards climate change would be strong influencers. To test these hypotheses, we distributed anonymous online surveys during October-November 2017 to multiple academic departments within the University of Florida, a land grant institution with top ranking programs in environmental sciences, agriculture, biodiversity conservation, and horticulture.

6	Vulnerability assessment of rural households to Urmia Lake drying (the case of Shabestar region)	Maleki, R.; Nooripoor, M.; Azadi, H.; Lebailly, P.	Sustainability (Switzerland)	2018	10.3390/su10061862	4	This study was designed to evaluate the vulnerability of rural households to UL drying in the Shabestar region. The vulnerability was calculated based on Intergovernmental Panel on Climate Change (IPCC) definition and using vulnerability index (VI).
6	Rebuilding pastoral social-ecological resilience on the Qinghai-Tibetan Plateau in response to changes in policy, economics, and climate	Gongbuzeren; Huntsinger, L.; Li, W.	Ecology and Society	2018	10.5751/ES-10096-230221	4	Field study of two villages in Guinan County of Qinghai Province, and Ruoergai County of Sichuan Province from 2011 to 2014 found that the villages responded to externally driven policy, economic, and climate changes with an innovative locally adapted quota-based grazing management system that preserves valuable management technologies, conserves rangeland resources, and provides individual opportunities for financial gain.
6	Risk management in rainfed agriculture: An analysis of strategies and adaptations followed by farmers in Madhya Pradesh	Raghavendra, K.J.; Suresh, A.	Indian Journal of Agricultural Sciences	2018		3	Madhya Pradesh is the major producer of soybean in India. Being predominantly rainfed, the state faces high risks in its cultivation. The study undertook a primary survey in Madhya Pradesh to analyze the risk perception of farmers, elucidate the strategies followed by farmers to adapt with the risk and to identify the factors influencing their adoption.
6	Farmer perceptions and climate change adaptation in the West Africa Sudan Savannah: Reality check in Dassari, Benin, and Dano, Burkina Faso	Callo-Concha, D.	Climate	2018	10.3390/cli6020044	3	In the study sites Dassari, Benin, and Dano, Burkina Faso, farmers' climate change perceptions and practiced coping measures were qualitatively and quantitatively recorded.
10	Climate change information source and indigenous adaptation strategies of cucumber farmers in Enugu State, Nigeria	Asadu, A.N.; Ozioko, R.I.; Dimelu, M.U.	Journal of Agricultural Extension	2018	10.4314/jae.v22i2.12	4	The study assessed the climate change information source and the indigenous adaptation strategies of cucumber farmers in Enugu State.
2	Paradigm shifts in rangeland communities' livelihoods activities as coping strategies to climate variability and restricted mobility	Tumusiime, D.; Nalule, A.S.; Nalubwama, S.	Livestock Research for Rural Development	2018		4	A cross section exploratory study was conducted to understand the changes in livelihood strategies of rangeland communities in face of climate change and restricted mobility.
2	Fishermen acceptance on introduction of fishing technology: Perception and its development strategies	Wiyono, E.S.; Raharjo, S.S.S.; Permana, S.M.	AACL Bioflux	2018		4	As an effort to cope with the decline in catches, we introduced fishing aids, Nelpin (Telepon Pintar), a mobile-based application that provides information on fishing. In order for this introduction to work well, a target fishermen perception mapping has been conducted before introducing Nelpin.
6	Adoption of small-scale irrigation farming as a climate-smart agriculture practice and its influence on household income in the Chinyanja Triangle, Southern Africa	Mango, N.; Makate, C.; Tamene, L.; Mponela, P.; Ndengu, G.	Land	2018	10.3390/land7020049	4	This article is concerned with the adoption of small-scale irrigation farming as a climate-smart agriculture practice and its influence on household income in the Chinyanja Triangle.
6	Land use scenario modeling based on local knowledge for the provision of ecosystem services in northern Ghana	Koo, H.; Kleemann, J.; Fürst, C.	Land	2018	10.3390/land7020059	4	The understanding of multiple effects by possible future development is essential for adapted land use planning. This study assessed the potential of land use scenarios for the provision of ecosystem services using local knowledge in two districts of northern Ghana. Local knowledge was gathered through surveys with extension officers, who are regarded as eligible knowledge holders for agricultural land use.
2	Impacts of climate change on soil Erosion in the great Lakes Region	Wang, L.; Cherkauer, K.A.; Flanagan, D.C.	Water (Switzerland)	2018	10.3390/w10060715	4	The macro-scale Variable Infiltration Capacity-Water Erosion Prediction Project (VIC-WEPP) soil erosion model was utilized to quantify soil losses under three climate change scenarios (A2, A1B, B1) using projections from three general circulation models (GFDL, PCM, HadCM3) for the Great Lakes region from 2000 to 2100.
6	Six languages for a risky climate: how farmers react to weather and climate change	Findlater, K.M.; Satterfield, T.; Kandlikar, M.; Donner, S.D.	Climatic Change	2018	10.1007/s10584-018-2217-z	3	We use a novel methodology to reveal patterns in climate-sensitive decision-making by commercial grain farmers in South Africa.
6	Climate change and agriculture in New York and Pennsylvania: Risk perceptions, vulnerability and adaptation among farmers	Lane, D.; Chatrchyan, A.; Tobin, D.; Thorn, K.; Allred, S.; Radhakrishna, R.	Renewable Agriculture and Food Systems	2018	10.1017/S1742170517000710	3	This study investigates farmer views and decisions related to climate change using data from six farmer focus groups conducted across New York and Pennsylvania.
6	Farm service agency employee intentions to use weather and climate data in professional services	Schattman, R.E.; Roesch-Mcnally, G.; Wiener, S.; Niles, M.T.; Hollinger, D.Y.	Renewable Agriculture and Food Systems	2018	10.1017/S1742170517000783	3	A national survey of United States Department of Agriculture Farm Service Agency (FSA) field staff (n = 4621) was conducted in 2016.
6	A modular approach for high-flux lactic acid production from methane in an industrial medium using engineered Methylomicrobium buryatense 5GB1	Garg, S.; Clomburg, J.M.; Gonzalez, R.	Journal of Industrial Microbiology and Biotechnology	2018	10.1007/s10295-018-2035-3	4	In this study, we first established a small-scale cultivation platform using Hungate tubes for growth of M. buryatense at medium-to-high-throughput that also enabled 2X faster growth compared to that obtained in traditional glass serum bottles. Then, employing a synthetic biology approach we engineered M. buryatense with varying promoter (inducible and constitutive) and ribosome-binding site combinations, and obtained a strain capable of producing l-lactate from methane at a flux 14-fold higher than previously reported.
6	Empirical analysis of factors influencing farmers crop insurance decisions in Pakistan: Evidence from Khyber Pakhtunkhwa province	Fahad, S.; Wang, J.; Hu, G.; Wang, H.; Yang, X.; Shah, A.A.; Huong, N.T.L.; Bilal, A.	Land Use Policy	2018	10.1016/j.landusepol.2018.04.016	3	Does not mention smallholders. This study aims to examine the factors influencing the adoption of crop insurance as a risk management strategy by Pakistani farmers.
6	Scrub typhus re-emergence in India: Contributing factors and way forward	Ranjan, J.; Prakash, J.A.J.	Medical Hypotheses	2018	10.1016/j.mehy.2018.03.019	4	Scrub typhus is a mite borne infectious disease which has re-emerged in India in the 3rd millennium after years of quiescence. In this review, the authors hypothesize the various factors responsible for resurgence of this disease.
2	Community response to a sustainable restoration plan for a superfund site	Sidhu, V.; Sarkar, D.; Datta, R.; Solomon, B.	Environmental Science and Pollution Research	2018	10.1007/s11356-018-1885-6	4	A sustainable restoration plan (SRP) was developed and tested in a greenhouse environment prior to field implementation. Cold-tolerant oilseed crops, camelina (Camelina sativa) and field pennycress (Thlaspi arvense), were grown on compost-fertilized stamp sands, which reduced soil erosion by acting as a vegetative cap. Oilseed plants produced normal yield, demonstrating their potential utilization as biofuel feedstock. Prior to implementing the SRP in field-scale in the Torch Lake Superfund site, a public opinion survey of the local community was conducted to understand the views of residents.
6	Empirical study on agricultural drought adaptation of typical rainfed areas in Shidian County, China	Wang, Z.; Ma, Q.; Wang, J.; Chen, S.; Fan, Y.; Deng, L.	International Journal of Disaster Risk Reduction	2018	10.1016/j.ijdrr.2018.03.024	4	In this study, we established a conceptual model of the relationship among environment changes, development demand and human adaptation to analyse the mechanism of agricultural drought adaptation of typical rainfed areas based on an empirical research at the government and farmers level.
2	Future risk assessment by estimating historical heat wave trends with projected heat accumulation using SimCLIM climate model in Pakistan	Nasim, W.; Amin, A.; Fahad, S.; Awais, M.; Khan, N.; Mubeen, M.; Wahid, A.; Rehman, M.H.; Ihsan, M.Z.; Ahmad, S.; Hussain, S.; Mian, I.A.; Khan, B.; Jamal, Y.	Atmospheric Research	2018	10.1016/j.atmosres.2018.01.009	4	This study identified the rising trend of heat wave over the period (1997–2015) for Punjab, Sindh and Baluchistan (provinces of Pakistan), which identified that most of the meteorological stations in Punjab and Sindh are highly prone to heat waves.
6	Investigating environmental migration and other rural drought adaptation strategies in Baja California Sur, Mexico	Haeffner, M.; Baggio, J.A.; Galvin, K.	Regional Environmental Change	2018	10.1007/s10113-018-1281-2	4	This paper explores the relationship between specific household traits (region of residence, head of household occupation, financial diversity, female level of education, land and animal ownership, social capital, and climate perception) and choice of specific adaptation strategies used by households in two sites in Baja California Sur, Mexico, during a severe drought from 2006 to 2012 using survey data and key informant interviews.

6	Changing sediment budget of the Mekong: Cumulative threats and management strategies for a large river basin	Kondolf, G.M.; Schmitt, R.J.P.; Carling, P.; Darby, S.; Arias, M.; Bizzi, S.; Castelletti, A.; Cochrane, T.A.; Gibson, S.; Kummu, M.; Oeurng, C.; Rubin, Z.; Wild, T.	Science of the Total Environment	2018	10.1016/j.scitotenv.2017.11.361	4	Hydropower dams, aggregate mines, flood-control dykes, and groundwater-irrigated agriculture have all provided short-term economic benefits throughout the basin. However, it is becoming evident that anthropic changes are significantly affecting the natural functioning of the river and its floodplains. We now ask if these changes are risking major adverse impacts for the 70 million people living in the Mekong Basin.
6	Thresholds in climate migration	McLeman, R.	Population and Environment	2018	10.1007/s11111-017-0290-2	4	This article reviews and makes linkages between existing research in climate adaptation, migration system dynamics, residential preferences, and risk perception to identify and explore the functioning and importance of thresholds.
6	Climate change perceptions and observations of agricultural stakeholders in the Northern Great Plains	Grimberg, B.I.; Ahmed, S.; Ellis, C.; Miller, Z.; Menalled, F.	Sustainability (Switzerland)	2018	10.3390/su10051687	3	The survey included Likert-scored responses and multiple-choice questions, and was completed by 452 participants, including conventional and organic farmers and ranchers, extension agents, crop consultants, and researchers.
6	The water-energy-food nexus: A fuzzy-cognitive mapping approach to support nexus-compliant policies in Andalusia (Spain)	Martinez, P.; Blanco, M.; Castro-Campos, B.	Water (Switzerland)	2018	10.3390/w10050664	4	In this research, we develop and apply a participatory modelling approach to identify the main interlinkages within the WEF nexus in Andalusia, as a starting point to developing a system dynamic model at a later stage.
2	Impacts of climate change and climate extremes on major crops productivity in China at a global warming of 1.5 and 2.0°C	Chen, Y.; Zhang, Z.; Tao, F.	Earth System Dynamics	2018	10.5194/esd-9-543-2018	4	Here, we evaluated the effects of climate change on growth and productivity of three major crops (i.e. maize, wheat, rice) in China during 2106-2115 in warming scenarios of 1.5 and 2.0 °C using a method of ensemble simulation with well-validated Model to capture the Crop-Weather relationship over a Large Area (MCWLA) family crop models, their 10 sets of optimal crop model parameters and 70 climate projections from four global climate models.
2	Climate change adaptation strategies and constraints in Northern Ghana: Evidence of farmers in Sissala West District	Fagariba, C.J.; Song, S.; Baoro, S.K.G.S.	Sustainability (Switzerland)	2018	10.3390/su10051484	4	The researchers used the SissalaWest District as a case study to determine factors influencing farmers' adaptation to climate change and strategies used to avert climate change impact.
6	Ethnobotany of the Sierra Nevada del Cocuy-Güicán: Climate change and conservation strategies in the Colombian Andes	Rodríguez, M.A.; Angueyra, A.; Cleef, A.M.; Van Andel, T.	Journal of Ethnobiology and Ethnomedicine	2018	10.1186/s13002-018-0227-6	4	We present an ethnobotanical inventory among local farmer communities and discuss the effects of vegetation change on the availability of useful plants.
2	Farmers' perceptions of impacts of climate variability on agriculture and adaptation strategies in Songkhla Lake basin	Somboonsuke, B.; Phitthayaphinant, P.; Sdoodee, S.; Kongmanee, C.	Kasetsart Journal of Social Sciences	2018	10.1016/j.kjss.2018.05.006	3	Does not mention smallholders.
27	Climate variability, perceptions and political ecology: Factors influencing changes in pesticide use over 30 years by Zimbabwean smallholder cotton producers	Zinyemba, C.; Archer, E.; Rother, H.-A.	PLoS ONE	2018	10.1371/journal.pone.0196901	4	This qualitative study assessed changes in the usage of pesticides by Zimbabwean smallholder cotton farmers in the past 30 years. Farmers reported an increase in the usage of pesticides, specifically insecticides, since the early 1980s. An increase in pest populations was also reported.
6	Integration anxiety: The cognitive isolation of climate change	Findlater, K.M.; Donner, S.D.; Satterfield, T.; Kandlikar, M.	Global Environmental Change	2018	10.1016/j.gloenvcha.2018.02.010	3	Here we show that commercial grain farmers in South Africa (N = 90), as a uniquely informative group, are struggling to mainstream climate change risk management despite their apparent incentive, capacity and willingness to adapt.
6	Ecosystem services management: An evaluation of green adaptations for urban development in Dhaka, Bangladesh	Zinia, N.J.; McShane, P.	Landscape and Urban Planning	2018	10.1016/j.landurbplan.2018.01.008	4	We evaluated green adaptation strategies (parks, gardens, green roof, rainwater harvest, green façades/wall, porous pavement, and green and blue belts) in the context of urban development and potential climate change impacts for the city of Dhaka, Bangladesh.
17	Climate change perception and response: Case studies of Fishers from Antigua and Efate	Blair, A.A.C.; Momtaz, S.	Ocean and Coastal Management	2018	10.1016/j.ocecoaman.2018.02.015	6	Location: Efate is the main urban centre of Vanuatu, and Antigua there is a fishing industry.
6	Modelling regional cropping patterns under scenarios of climate and socio-economic change in Hungary	Li, S.; Juhász-Horváth, L.; Pintér, L.; Rounsevell, M.D.A.; Harrison, P.A.	Science of the Total Environment	2018	10.1016/j.scitotenv.2017.10.038	4	This study identified potential regional challenges in arable land use systems, which may arise from climate and socio-economic change for two counties in western Hungary: Veszprém and Tolna.
2	Adaptation strategies of agriculture and water management to climate change in the Upper Tarim River basin, NW China	Huang, S.; Wortmann, M.; Duethmann, D.; Menz, C.; Shi, F.; Zhao, C.; Su, B.; Krysanova, V.	Agricultural Water Management	2018	10.1016/j.agwat.2018.03.004	4	This study is the first integrated assessment of agriculture and water management under climate change scenarios for this arid river basin in Central Asia. It aims to analyze changes in river discharge of the Upper Tarim under 28 climate projections for 3 representative concentration pathways (RCP) and the A1B scenario and 30 combinations of changes in land use (agricultural area) and water saving measures considered as adaptation strategies.
2	A Climate for Change? Norwegian Farmers' Attitudes to Climate Change and Climate Policy	Brobakk, J.	World Political Science	2018	10.1515/wps-2018-0003	3	In this article, I study Norwegian farmers' climate change perceptions and priorities, and examine what it would take for them to consider implementing mitigation measures on their own farms.
6	Economic analysis of integrated game–livestock farming as an alternative land use option in Rural Limpopo province, South Africa	Cholo, M.S.; Oluwatayo, I.B.; Chaminuka, P.	Agroecology and Sustainable Food Systems	2018	10.1080/21683565.2017.1373382	4	This paper examines perceptions and costs/benefits associated with integrating livestock with game.
6	Understanding climate change vulnerability, adaptation and risk perceptions at household level in Khyber Pakhtunkhwa, Pakistan	Ullah, W.; Nihei, T.; Nafees, M.; Zaman, R.; Ali, M.	International Journal of Climate Change Strategies and Management	2018	10.1108/IJCCSM-02-2017-0038	3	Does not mention smallholders. This study aims to investigate risks associated with climate change vulnerability and in response the adaptation methods used by farming communities to reduce its negative impacts on agriculture in Pakistan. Design/methodology/approach: The study used the household survey method of to collect data collected in Charsadda district of Khyber Pakhtunkhwa province, involving 116 randomly selected respondents.
2	Willingness to pay for improved water services in mining regions of developing economies: Case study of a coal mining project in Thar coalfield, Pakistan	Aslam, H.; Liu, J.; Mazher, A.; Mojo, D.; Muhammad, I.; Fu, C.	Water (Switzerland)	2018	10.3390/w10040481	4	Local communities in mining regions are vulnerable to water scarcity risks caused by extensive mining and changing climate. To mitigate such risks, we adopt a non-market valuation of low income communities' preferences for improved access to water services, as an effort to develop pro-poor policies that bring long-term water security and benefits to the local people.
6	What you sow is what you reap? (Dis-)Incentives for adaptation intentions in farming	Buelow, F.; Cradock-Henry, N.	Sustainability (Switzerland)	2018	10.3390/su10041133	3	To motivate adaptation, diverse incentives are in place most notably through the European Union's Common Agricultural Policy which offers financial incentives to farmers. However, the effect of incentives on behaviour appears to be low. To better understand adaptation intentions, we report on the results of a survey experiment assessing framing effects on German farmers.
6	Indigenous Knowledge, Global Ignorance? Insights from an Eastern Cape Climate Change Study	Apraku, A.; Akpan, W.; Moyo, P.	South African Review of Sociology	2018	10.1080/21528586.2018.1532813	4	This paper is based on findings from a study of climate change awareness and adaptation strategies in rural and peri-urban communities in East London and Port Elizabeth, Eastern Cape, South Africa. Based on empirical research with 140 respondents, the study found that indigenous knowledge plays an important role in the ways local residents adapt to, and in some ways curb, the adverse impacts of climate change.

2	Climate Report from Uruguay	Meerhoff, M.; Bernardi, R.	Performance Research	2018	10.1080/13528165.2018.1495949	4	Article about land use changes in Uruguay (in this case from grasslands to intensive agriculture and plantations of exotic trees) have led to a notorious deterioration of key watersheds, which increased public awareness and placed the environment in the public agenda.
6	'Life. Brought to you by' … coal? Business responses to climate change in the Hunter Valley, NSW, Australia	Bowden, V.	Environmental Sociology	2018	10.1080/23251042.2017.1382032	3	This article outlines the views of business leaders' attitudes to climate change in the lead up to implementation, offering a unique perspective of where they converge and vary.
6	Farmers' perceptions, awareness, attitudes and adaption behaviour towards climate change	Akhtar, R.; Afroz, R.; Masud, M.M.; Rahman, M.; Khalid, H.; Duasa, J.B.	Journal of the Asia Pacific Economy	2018	10.1080/13547860.2018.1442149	3	Using responses from a questionnaire survey conducted on a sample of 400 rice farmers from Kedah in Malaysia, this article examines rice farmers' perception, awareness, attitudes and adaptation behaviours towards mitigating climate change.
6	U.S. Inland pacific northwest wheat farmers' perceived risks: Motivating intentions to adapt to climate change?	Roesch-Mcnally, G.E.	Environments - MDPI	2018	10.3390/environments5040049	3	The Regional Approaches to Climate Change for the Pacific Northwest Agriculture (REACCH PNA) project was a USDA-National Institute of Food and Agriculture (NIFA) funded effort aimed at taking a comprehensive and interdisciplinary approach to understanding the implications of climate change on wheat and other cereal crop production in the inland Pacific Northwest (iPNW). As part of this project, two comprehensive surveys of wheat producers were conducted in 2012/13 and 2015/16, which included questions concerning production practices, risk perception, and attitudes towards climate change adaptation and mitigation. This paper explores farmers' anticipated adaptive responses to climate change across five different adaptation strategies, including, cropping system, crop rotation, tillage practices, soil conservation practices, and crop insurance.
6	Climate change and Chinese farmers: Perceptions and determinants of adaptive strategies	Zhai, S.-Y.; Song, G.-X.; Qin, Y.-C.; Ye, X.-Y.; Leipnik, M.	Journal of Integrative Agriculture	2018	10.1016/S2095-3119(17)61753-2	3	This paper is based on an extensive survey of 1 500 farmers and their households in Henan Province in China during 2013–2014. Henan is the largest agricultural province in China with over 51 million farmers
2	Vulnerability of human communities in Mexican mangrove ecosystems: an ecosystem-based adaptation approach	Carranza Ortiz, G.; Gómez-Mendoza, L.; Caetano, E.; Infante Mata, D.	Investigaciones Geograficas	2018	10.14350/rig.59502	4	The Ecosystem-based Adaptation (EbA) approach was used to identify the local benefits provided by mangroves and increases their adaptive capacity to changing climate. To evaluated conservation status, the vegetation structure was monitoring by transects.
6	Exploring the Influence of Smallholders' Perceptions Regarding Water Availability on Crop Choice and Water Allocation Through Socio-Hydrological Modeling	Kuil, L.; Evans, T.; McCord, P.F.; Salinas, J.L.; Blöschl, G.	Water Resources Research	2018	10.1002/2017WR021420	4	Guided by cognitive theory and the theory of bounded rationality, this research develops a novel, socio-hydrological model framework that can explore how a farmer's perception of water availability impacts crop choice and water allocation.
6	Dealing with socioeconomic and climate-related uncertainty in small-scale salt producers in rural Sampang, Indonesia	Helmi, A.; Sasaoka, M.	Journal of Rural Studies	2018	10.1016/j.jrurstud.2018.02.005	4	In this study, we aimed to investigate the uncertainty events affecting small-scale salt producers and find out how small-scale salt producers were responding to the combinations of climatic and socioeconomic uncertainty they had experienced.
2	An EPIC model-based wheat drought risk assessment using new climate scenarios in China	Yue, Y.; Wang, L.; Li, J.; Zhu, A.-X.	Climatic Change	2018	10.1007/s10584-018-2150-1	3	This paper investigates a method for assessing future wheat drought risk using climate scenarios and a crop model. We illustrate the utility of such an approach by assessing the risk of wheat drought under climate change scenarios in China using the Environmental Policy Integrated Climate model.
2	The tea landscape of Assam: Multi-stakeholder insights into sustainable livelihoods under a changing climate	Biggs, E.M.; Gupta, N.; Saikia, S.D.; Duncan, J.M.A.	Environmental Science and Policy	2018	10.1016/j.envsci.2018.01.003	4	This paper goes towards addressing this knowledge deficit through adopting a sustainable livelihoods approach for investigating the tea landscape of Assam.
6	Climate change and crop diversity: farmers' perceptions and adaptation on the Bolivian Altiplano	Meldrum, G.; Mijatović, D.; Rojas, W.; Flores, J.; Pinto, M.; Mamani, G.; Condori, E.; Hilaquita, D.; Gruberg, H.; Padulosi, S.	Environment, Development and Sustainability	2018	10.1007/s10668-016-9906-4	4	This study explored the role of crop diversity in farmers' adaptation actions in eight Aymara communities on the northern Bolivian Altiplano.
6	Charting the water footprint for Malaysian crude palm oil	Subramaniam, V.; Hashim, Z.	Journal of Cleaner Production	2018	10.1016/j.jclepro.2018.01.061	4	The purpose of this study was to evaluate the impacts associated with the use of water by the oil palm trees and the industry for the production of crude palm oil in Malaysia; evaluate the uncertainties of the outcome of a study based on pathway assumptions and the choice of allocation.
6	Perceptions of adaptation, resilience and climate knowledge in the Pacific: The cases of Samoa, Fiji and Vanuatu	Walshe, R.A.; Chang Seng, D.; Bumpus, A.; Auffray, J.	International Journal of Climate Change Strategies and Management	2018	10.1108/IJCCSM-03-2017-0060	3	This research examined three key groups in Samoa, Fiji and Vanuatu: secondary school teachers, media personnel, and rural subsistence livelihood-based communities that live near or in conservation areas.
6	Farmers' value assessment of sociocultural and ecological ecosystem services in agricultural landscapes	Temesgen, H.; Wu, W.	Sustainability (Switzerland)	2018	10.3390/su10030703	4	This article addresses farmers' evaluations and perceptions of 16 Ecosystem Services that are provided by five major land uses within two catchments, using a combined method of data generation and synthesis.
2	Climate change and agriculture: An overview of farmers perception and adaptations in Balambat Tehsil, District Dir Lower, Pakistan	Nasir, M.J.; Khan, A.S.; Alam, S.	Sarhad Journal of Agriculture	2018	10.17582/journal.sja/2018/34.1.85.92	3	The abstract does not mention smallholders. The study was carried out in Balambat Tehsil District Dir Lower. The present research was aimed to determine the ability of farmers to detect climate change and how they have adapted to whatever climate change they believe has occurred
6	From vegetal waste to bioethanol in agriculture	Bran, Ş.D.; Dobre, I.	Quality - Access to Success	2018		4	The paper aims at emphasizing the agricultural potential through the vegetal residues of the main field crops, sustainable supply with renewable fuels. The need to recycle the materials is already known and the practices of developed countries are quite relevant.
6	Knowing climate as a social-ecological-atmospheric construct	Clifford, K.R.; Travis, W.R.	Global Environmental Change	2018	10.1016/j.gloenvcha.2017.12.007	3	This study focuses on how people come to "know" climate, not just climate change, in a more fundamental way. To discern the structure of these knowledges we conducted semi-structured interviews of residents of a basin in the U.S. Rocky Mountains whose livelihoods and avocations bring them in routine contact with weather, climate, and landscape.
2	Climate change and anthropogenic impacts on wetland and agriculture in the Songnen and Sanjiang Plain, northeast China	Chen, H.; Zhang, W.; Gao, H.; Nie, N.	Remote Sensing	2018	10.3390/rs10030356	4	This paper assessed the spatiotemporal land use and land cover changes (LULCC), especially for conversion from marshland to other LULC types (e.g., croplands) over the Songnen and Sanjiang Plain (SNP and SJP), northeast China, during the past 35 years (1980-2015).
6	Conservation Agriculture to buffer and alleviate the impact of climatic variations in Madagascar: Farmers' perception	Penot, E.; Fevre, V.; Flodrops, P.; Razafimahatratra, H.M.	Cahiers Agricultures	2018	10.1051/cagri/2018009	4	Article about: Conservation Agriculture (CA) has been promoted during the last 15 years in Madagascar to develop a sustainable rainfed agriculture in order to cope with low fertility upland soils, soil erosion, low productivity and erratic rainfall.
6	Traditional ecological knowledge of polar bears in the northern Eeyou marine region, Québec, Canada	Laforest, B.J.; Hébert, J.S.; Obbard, M.E.; Thiemann, G.W.	Arctic	2018	10.14430/arctic4696	4	Polar bears are important socio-cultural symbols in the communities of the Eeyou Marine Region (EMR) in northwestern Québec, Canada. In June 2012, we conducted 15 semi-directed interviews on the subject of polar bear biology and climate change with local elders and hunters in three communities in the northern EMR: Wemindji, Chisasibi, and Whapmagoostui. The interviews held in Whapmagoostui included informants from Kuujjuarapik, the adjacent Inuit community. The interviews addressed knowledge gaps in the Recovery Strategy for Polar Bear in Ontario.

2	Farming with crops and rocks to address global climate, food and soil security /631/449 /706/1143 /704/47 /704/106 perspective	Beerling, D.J.; Leake, J.R.; Long, S.P.; Scholes, J.D.; Ton, J.; Nelson, P.N.; Bird, M.; Kantzas, E.; Taylor, L.L.; Sarkar, B.; Kelland, M.; DeLucia, E.; Kantola, I.; Müller, C.; Rau, G.; Hansen, J.	Nature Plants	2018	10.1038/s41477-018-0108-y	4	Article about: Biogeochemical improvement of soils by adding crushed, fast-reacting silicate rocks to croplands is one such CO2-removal strategy. This approach has the potential to improve crop production, increase protection from pests and diseases, and restore soil fertility and structure.
6	Governmentality of the Arctic as an international region	Albert, M.; Vasilache, A.	Cooperation and Conflict	2018	10.1177/0010836717703674	4	The present article argues that the prospects for the Arctic are strongly intertwined with perceptions and depictions of it as an international region subject to emerging practices of governmentality.
6	Assessing the role of farmer field schools in promoting pro-adaptive behaviour towards climate change among Jamaican farmers	Tomlinson, J.; Rhiney, K.	Journal of Environmental Studies and Sciences	2018	10.1007/s13412-017-0461-6	4	The study assesses the particular ways that participation in the farmer field school program has influenced the knowledge, attitudes and perceptions of FFS trainees about climate change compared to their non-FFS counterparts. Preliminary results indicate that FFS participants perceive themselves as having a higher adaptive capacity in comparison to non-field school participants, amidst both groups having access to similar stocks of assets.
2	Climate change knowledge, concerns, and behaviors among Caribbean fishers	Baptiste, A.K.	Journal of Environmental Studies and Sciences	2018	10.1007/s13412-017-0434-9	3	The study focuses on the fishing industry.
6	The Stimuli-Actions-Effects-Responses (SAER)-framework for exploring perceived relationships between private and public climate change adaptation in agriculture	Mitter, H.; Schönhart, M.; Larcher, M.; Schmid, E.	Journal of Environmental Management	2018	10.1016/j.jenvman.2017.12.063	3	We therefore developed the framework SAER (Stimuli-Actions-Effects-Responses) to investigate perceived relationships between private and public climate change adaptation in agriculture at regional scale. In particular, we explore agricultural experts' perceptions on (i) climatic and non-climatic factors stimulating private adaptation, (ii) farm adaption actions, (iii) potential on-farm and off-farm effects from adaptation, and (iv) the relationships between private and public adaptation. The SAER-framework is built on a comprehensive literature review and empirical findings from semi-structured interviews with agricultural experts from two case study regions in Austria.
6	Modeling future water footprint of barley production in Alberta, Canada: Implications for water use and yields to 2064	Masud, M.B.; McAllister, T.; Cordeiro, M.R.C.; Faramarzi, M.	Science of the Total Environment	2018	10.1016/j.scitotenv.2017.11.004	4	We developed agro-hydrological models to assess the water footprint (WF) of barley by simulating future crop yield (Y) and consumptive water use (CWU) within the agricultural region of Alberta.
6	Developing an instrument to measure autonomous adaptive capacity to climate change among urban households	Selm, K.R.; Hess, G.R.; Nils Peterson, M.; Beck, S.M.; McHale, M.R.	Frontiers in Ecology and Evolution	2018	10.3389/fevo.2018.00013	4	We used Raleigh, NC as a case study to explore the dimensions of autonomous adaptive capacity of urban households and to create a scale and associated survey instrument to measure them. Our approach was guided by four capitals that support human livelihoods: social, human, physical, and financial. We surveyed 200 households in Raleigh, NC, and used a principal components analysis to test the scale and survey instrument.
6	Mixed methods approach to understanding farmer and agricultural advisor perceptions of climate change and adaptation in Vermont, United States	Schattman, R.E.; Méndez, V.E.; Merrill, S.C.; Zia, A.	Agroecology and Sustainable Food Systems	2018	10.1080/21683565.2017.1357667	3	Location: Vermont, USA. The relationships among farmers' belief in climate change, perceptions of climate-related risk, and use of climate adaptation practices is a growing topic of interest in U.S. scholarship.
6	Climate change and adoption of sustainable land management practices in the Niger basin of Benin	Lokonon, B.O.K.; Mbaye, A.A.	Natural Resources Forum	2018	10.1111/1477-8947.12142	3	Does not mention smallholders. This paper examines the determinants of farmers' perceptions of climate change and subsequent adoption of sustainable land management practices in the Niger basin of Benin.
6	Bare Nature	Shields, R.	Space and Culture	2018	10.1177/1206331217736741	4	This article considers the ethical implications of a stance toward or relation with the natural environment that could be characterized as dominant across many sectors of not only the economy but consumption patterns generally.
2	Climate mitigation, low-carbon society, and dynamism of educational institutes in a low-income country	Ali, G.; Anbren, S.; Bashir, M.K.	Environmental Science and Pollution Research	2018	10.1007/s11356-017-0607-9	4	This paper aims to investigate carbon footprints of faculty members of University of Agriculture Faisalabad (UAF) associated with income and education in pursuance of a low-carbon society.
6	Awareness of sea-level response under climate change on the coast of Ghana	Evadzi, P.I.K.; Scheffran, J.; Zorita, E.; Hünicke, B.	Journal of Coastal Conservation	2018	10.1007/s11852-017-0569-6	4	This study assesses the impact of future erosion on the coastal land cover of Ghana. This assessment estimates approximately 2.66 km2, 2.77 km2, and 3.24 km2 of coastal settlements, 2.10 km2, 2.20 km2 and 2.58 km2 of lagoons, 1.39 km2, 1.46 km2 and 1.71 km2 of wetlands to be at risk of inundation by the year 2050 based on coastal erosion estimates for the 2.6, 4.5 and 8.5 Representative Concentration Pathways (RCPs) used in the Fifth Assessment Report (AR5) of the Intergovernmental Panel on Climate Change (IPCC). This study also assesses the level of awareness of respondents to SLR on the coast of Ghana and explores the availability and level of integration of scientific knowledge of SLR into coastal adaptation strategies in Ghana.
2	Effects of irrigation over three years on the amino acid composition of Treixadura (Vitis vinifera L.) musts and wines, and on the aromatic composition and sensory profiles of its wines	Bouzas-Cid, Y.; Falqué, E.; Orriols, I.; Mirás-Avalos, J.M.	Food Chemistry	2018	10.1016/j.foodchem.2017.08.013	4	The aim of the current study was to assess the amino acid profile of musts and wines, volatile composition and sensory profile of wines from Vitis vinifera (L.) cultivar 'Treixadura' obtained from vines under rain-fed and irrigation conditions over three consecutive vintages (2012–2014).
6	Economic, policy, and social trends and challenges of introducing oilseed and pulse crops into dryland wheat cropping systems	Maaz, T.; Wulfhorst, J.D.; McCracken, V.; Kirkegaard, J.; Huggins, D.R.; Roth, I.; Kaur, H.; Pan, W.	Agriculture, Ecosystems and Environment	2018	10.1016/j.agee.2017.03.018	4	This paper analyses the historical spatial and temporal trends in crop diversification in three distinct cropping regions, including the Canadian prairies, Australian wheat belt, and the inland Pacific Northwest USA (iPNW). The first objective was to identify key sociological, economic, and policy drivers that corresponded with historical crop intensification and diversification in Canada and Australia over the last 50 years. The second objective was to identify key economic, policy, and social constraints that have historically limited intensification and diversification in the iPNW, a cereal-dominated region.
10	Farmer perceptions of conflict related to water in Zambia	Marcantonio, R.A.; Attari, S.Z.; Evans, T.P.	Sustainability (Switzerland)	2018	10.3390/su10020313	3	Does not mention smallholders. Here, we address these questions by surveying farmers in southern Zambia in 2015, where we asked respondents to define conflict, assessed their perceptions of past and future conflict, as well as perceptions of rainfall and water availability.
6	Perceptions of Threats Facing Cabo de Palos - Islas Hormigas MPA and Potential Solutions	Hogg, K.; Semitiel-García, M.; Noguera-Méndez, P.; Gray, T.; Young, S.	Coastal Management	2018	10.1080/08920753.2018.1405330	3	Many marine protected areas (MPAs) face a multitude of threats to the ecosystems that they have been established to conserve. This study is based on 111 interviews conducted in 2013–2014 designed to discover the perceptions of stakeholders about the threats, the causes of the threats, and their responses to the threats, to a well-established MPA–Cabo de Palos - Islas Hormigas (CPH-MPA).
6	Migration as adaptation strategy to cope with climate change: A study of farmers' migration in rural India	Jha, C.K.; Gupta, V.; Chattopadhyay, U.; Amarayil Sreeraman, B.	International Journal of Climate Change Strategies and Management	2018	10.1108/IJCCSM-03-2017-0059	3	Does not mention smallholders. This study aims to evaluate the link between climate/weather change and farmer migration in Bihar, India.
6	Community-based adaptation to climate variability and change: mapping and assessment of water resource management challenges in the North Pare highlands, Tanzania	Velempini, K.; Smucker, T.A.; Clem, K.R.	African Geographical Review	2018	10.1080/19376812.2016.1229203	4	In contrast to the technocentric emphasis on new irrigation infrastructure that has been the hallmark of Tanzania's climate change adaptation policy, this paper examines challenges for local management of existing 'traditional' small-scale water resources through community-engaged research that is grounded in the emerging methods of community-based adaptation. We examine the shifting local institutional arrangements during the colonial and postcolonial periods that have shaped the social dynamics of climate risk and water resources management in the North Pare highlands. Secondly, we examine contemporary water use and management and perceptions of change in the North Pare highlands, where smallholder farmers manage water resources to fulfill domestic and other requirements of an intensively cultivated landscape

10	Adoption of appropriate technologies among smallholder farmers in Kenya	Kalungu, J.W.; Leal Filho, W.	Climate and Development	2018	10.1080/17565529.2016.1182889	4	This study investigates the levels of awareness and adoption of some appropriate technologies at two pairs of sites matched for rainfall, but differing in temperature, in semi-arid and sub-humid regions of Kenya.
2	Public perception of climate change in Alaska: A case study of opinion-mining using twitter	Bergstedt, H.; Ristea, A.; Resch, B.; Bartsch, A.	GI_Forum	2018	10.1553/GISCIENCE2018_01_S47	4	In the course of the research presented in this paper, we analysed Twitter data for the period 2013-2017, from which we extracted opinions concerning climate change topics by applying sentiment analysis (polarity and feelings) and climate change dictionaries, on a 10 x 10 km grid for the State of Alaska, USA.
6	Farmers' adaptation strategies to climate change and their implications in the Zou department of South Benin	Fadina, A.M.R.; Barjolle, D.	Environments - MDPI	2018	10.3390/environments5010015	3	Does not mention smallholders. This paper aims to contribute to an understanding of farmers' adaptation choices, determinants of the adaptation choices and the long-term implications of the adaptation choices.
6	Has the environment changed – What can be done to help the fishermen community? The views of the small scale fishermen in Malaysia	Idris, K.; Muhammad, M.; Samah, A.A.; Suandi, T.; Shaffril, H.A.M.	Pertanika Journal of Social Sciences and Humanities	2018		4	The inconsistencies among findings and lack of related studies have led to this study, the main objective of which is to gain the views of Malaysian small-scale fishermen on environmental changes and to recommend several strategies that can assist the fishermen community in coping with changes.
16	Mitigation and adaptation analysis of the climate change impact using sustainable livelihood model	Sari, D.A.P.; Falatehan, F.; Irawan, D.S.; Sedana, G.; Rahim, R.	International Journal of Engineering and Technology (UAE)	2018		3	Does not mention smallholders. This study aims to identify and analyze the farmers' perception of the climate variability and the impacts of the climate variability, identify and analyze the vulnerability and the income of the farmers due to the climate variability, identify and analyze the farmer strategy in anticipating and adapting the climate variability and recommending the adaptation mechanism based on engineering, institutional, technological, social, economic, and cultural organizations to the farmer in responding to the climate variability.
2	Conservation activities for Mountain viper, Montivipera albizona (Nilson, Andrén and Flärdh, 1990) in Anatolia, Turkey	Çiçek, K.; Afsar, M.; Bağda, E.; Tok, C.V.	Ecologia Balkanica	2018		4	Here, we evaluated the present status and main threats of the Mountain viper by 60-days intensive fieldwork and interviews with locals.
2	Co-producing climate policy and negative emissions: Trade-offs for sustainable land-use	Dooley, K.; Christoff, P.; Nicholas, K.A.	Global Sustainability	2018	10.1017/sus.2018.6	4	This paper examines the sustainability of land-based carbon removal, using a co-production lens to explain the legitimization of NETs as key mitigation options. We evaluate the scale of NETs in the most recent generation of <2 °C scenarios, finding that projected levels of land-based mitigation imply strong trade-offs with other societal goals.
6	Farmers perceptions of climate change related events in Shendam and Riyom, Nigeria	Goyol, S.; Pathirage, C.	Economies	2018	10.3390/economies6040070	3	Does not mention smallholders. Based on case studies of two local communities in Plateau state in Nigeria, this paper utilizes a range of perceptions to examine the impacts of climate-related events on agrarian infrastructures and how agrarian livelihood systems are, in turn, affected.
16	Factors influencing farmers' awareness and choice of indigenous practices in adapting to climate change and variability in Northern Ghana	Alhassan, S.I.; Shaibu, M.T.; Kuwornu, J.K.M.; Damba, O.T.	West African Journal of Applied Ecology	2018		4	This study examined farmers' awareness and usage of indigenous adaptation strategies using the Heckman Two-Stage Sample Selection Model.
6	Sustainability: A missing dimension in climate change adaptation discourse in africa?	Bhatasara, S.; Nyamwanza, A.	Journal of Integrative Environmental Sciences	2018	10.1080/1943815X.2018.1450766	4	The paper argues for a clear framework of sustainability in adaptation discourse which encompasses awareness to contextual aspects in responding to climate variability and change as well as resilience aspects. The paper also calls for an expansion of the knowledge base around the concept of 'climate-smart agriculture' towards effectively incorporating sustainability aspects in climate change adaptation discourse.
6	Perception of risk sources by chilean blueberry producers [Percepção das fontes de risco pelos produtores chilenos de mirtilo]	Lobos, G.; Schnettler, B.; Mena, C.; Ormazábal, Y.; Cantillana, J.C.; Retamales, J.B.	Revista Brasileira de Fruticultura	2018	10.1590/0100-29452018248	4	The main objective of this study was to learn about the perception of the main sources of risk that blueberry growers face in the Maule Region, Chile.
6	Perception, knowledge, and behavior towards climate change: A survey among agricultural professionals in Hamadan province, Iran	Jamshidi, O.; Asadi, A.; Kalantari, K.; Azadi, H.	Journal of Agricultural Science and Technology	2018		3	The purpose of this study was to evaluate perception towards climate change, level of knowledge and climate change related behavior of agricultural professionals in Hamadan Province, Iran.
27	Cultural beliefs of time orientation and social self-construal: Influences on climate change adaptation	Terblanche-Greeff, A.C.; Dokken, J.-V.; van Niekerk, D.; Loubser, R.A.	Jamba: Journal of Disaster Risk Studies	2018	10.4102/jamba.v10i1.510	6	Q-methodology was used to study perspectives and beliefs in three peri-urban communities in South Africa and to investigate the interrelation between themes such as TO, SSC, climate change awareness and climate change causality.
2	Perceptions vulnerability index: A measure of land degradation process in northern irrigated plains of Pakistan	Israr, M.; Ullah, S.; Ahmad, S.; Yaseen, A.; Pervaiz, U.; Ahmad, N.	Sarhad Journal of Agriculture	2018	10.17582/journal.sja/2018/34.4.840.849	4	Land Degradation (LD) is the most significant environmental issue in the present world and posing a challenge to the goals of future sustainability. The aims of this study was to measure the agriculture land degradation process in northern irrigated plains of Pakistan by studying the perceptions of the farmers about the different dimensions of agriculture LD with the construction of LD index.
2	Farmers' adaptation to climate change in Pakistan: Perceptions, options and constraints	Salman, A.; Husnain, M.I.; Jan, I.; Ashfaq, M.; Rashid, M.; Shakoor, U.	Sarhad Journal of Agriculture	2018	10.17582/journal.sja/2018/34.4.963.972	3	Does not mention smallholders. Using data of 205 conventional farmers from three district of Punjab province, this study provides insights into farmers' perceptions about climate change, on-going adaptation practices, and constraints to various adaption strategies.
6	Local government climate change mitigation and adaptation ranking assessment	Kole, A.; Ellison, J.C.	International Journal of Global Warming	2018	10.1504/IJGW.2018.095997	4	Climate change awareness in local areas is critical, and this study assessed levels of mitigation and adaptation of local government areas (LGAs), across the rural/urban State of Tasmania. Fourteen indicators were developed in the sectors of energy, transport, awareness, and physical carbon sinks, and allocated quantitative parameters for ranking.
6	Socio-environmental impacts of land use/cover change in ethiopian central rift valley lakes region, East Africa	Bekele, B.; Wu, W.; Legesse, A.; Temesgen, H.; Yirsaw, E.	Applied Ecology and Environmental Research	2018	10.15666/aeer/1605_66076632	4	Hence, this study is aimed to assess the socio-environmental impacts of LUCC in more dynamic and fragile landscapes of the Ethiopian Central Rift Valley lakes region. We used a combination of data from Remote Sensing, GIS-based processing, household survey and meteorological stations to quantify and analyze LUCC impacts.
6	Nexus of agriculture, gdp, population and climate change: Case of some eurasian countries and Turkey	Doğan, H.G.	Applied Ecology and Environmental Research	2018	10.15666/aeer/1605_69636976	4	This study examines the effects of variables including the share of the agricultural fields within total area, agricultural added value, GDP and population on the CO2 release within the scale of the Eurasian Region and Turkey.
6	Farmers' perceptions and adaptation strategies to climate change in Punjab agriculture	Kumar, S.; Sidana, B.K.	Indian Journal of Agricultural Sciences	2018		3	Does not mention smallholders. Farmers are the hardest hit as they have to continuously respond to climate variations. In order to know the farmers' perceptions about climate change and the adaptation strategies the present study collected the primary data from 200 farmers from different agro-climatic zones of Punjab.
6	Sustainable coasts? Perceptions of change and livelihood vulnerability in nordland, norway	Rybråten, S.; Bjørkan, M.; Hovelsrud, G.K.; Kaltenborn, B.P.	Local Environment	2018	10.1080/13549839.2018.1533931	3	Based on interviews with 13 farmers, fishers and aquaculture employees from coastal Nordland, northern Norway, this study demonstrates how the local stakeholders' perceptions of change and experiences of vulnerability are closely linked to their livelihood values and worldviews.

2	Alternative tourism in the biosphere reserve of vizcaino (rebivi), Mexico: Facing the impacts of climate change	Ivanova, A.; RamÍRez, E.; MontaÑO, A.; Serrano, R.	WIT Transactions on Ecology and the Environment	2018	10.2495/ST180181	4	The objectives of the present research are the following: a) Characterize the main alternative tourism activities in the REBIVI, b) Analyze the main impacts of climate change on the alternative tourism in the short and medium term, and c) establish measures of adaptation to these impacts.
2	Incidence, Risk Factors, and Epidemiology of Cystic Echinococcosis: A Complex Socioecological Emerging Infectious Disease in Khyber Pakhtunkhwa, Province of Pakistan	Haleem, S.; Niaz, S.; Qureshi, N.A.; Ullah, R.; Alsaid, M.S.; Alqahtani, A.S.; Shahat, A.A.	BioMed Research International	2018	10.1155/2018/5042430	4	Cystic echinococcosis is a serious zoonotic disease caused by Echinococcus granulosus species complex. The current study is the first attempt to determine the level of infection in domestic livestock and to explore the CE-related knowledge and awareness among livestock farmers in different districts of Khyber Pakhtunkhwa, province of Pakistan.
2	The politics of negative emissions technologies and decarbonization in rural communities	Buck, H.J.	Global Sustainability	2018	10.1017/sus.2018.2	4	This paper analyzes prospective challenges for negative emissions through examining how decarbonization practices are evolving in one particular landscape: The Imperial Valley in southeast California, a desert landscape engineered for industrial agriculture.
6	Vulnerability to climate change and residents' adaptations in coastal areas of Soc Trang Province, Vietnam	Tamura, M.; Yasuhara, K.; Ajima, K.; Trinh, V.C.; Van Pham, S.	International Journal of Global Warming	2018	10.1504/IJGW.2018.094312	3	The Mekong Delta of Vietnam, which is home to a growing population that currently stands at 17.2 million people, has been experiencing more frequent and severe flooding, especially in Soc Trang Province. Historical and present-day images obtained using an uncrewed aerial vehicle and satellites showed rapid erosion of coastal areas and damage to infrastructure for flood control. A perception survey on more than a thousand residents conducted in 2014 showed that the adaptations pursued at the community level were limited by economic factors and education level.
27	Design of a human biomonitoring community-based project in the Northwest Territories Mackenzie Valley, Canada, to investigate the links between nutrition, contaminants and country foods	Ratelle, M.; Laird, M.; Majowicz, S.; Skinner, K.; Swanson, H.; Laird, B.	International Journal of Circumpolar Health	2018	10.1080/22423982.2018.1510714	4	This article details the design of a community-based biomonitoring study that investigates country food use, contaminant exposure and nutritional status in Canadian subarctic First Nations in the Dehcho and Sahtù regions.
6	Factors explaining household payment for potable water in South Africa	Akinyemi, B.E.; Mushunje, A.; Fashogbon, A.E.	Cogent Social Sciences	2018	10.1080/23311886.2018.1464379	4	Hence, this study seeks to explain factors influencing household payment for potable water utilizing the recently released South African Living Conditions Survey 2014/2015.
2	Analysis and prediction of greenhouse gas emissions from wheat production in China	Liu, G.; Xu, W.; Dai, Y.; Xu, Z.	Chemical Engineering Transactions	2018	10.3303/CET1870220	4	With the increasing awareness of climate change, food carbon footprint (CF) has been analysed by many studies. Wheat is one of the world's most favoured food sources, reaching millions of people on a daily basis. In this study, the wheat CF and total greenhouse gas (GHG) emissions were investigated using national statistical data for the period of 2003-2016.
6	Perception of climate change impacts on agricultural production decisions: Insights from the Banikoara commune of Benin	Mounirou, I.; Lokonon, B.O.K.	Journal of Agriculture and Environment for International Development	2018	10.12895/jaeid.20181.695	3	This article analyzes producers' perception of the impacts of climate change on agricultural production decisions. The data used are collected through a survey of 406 cotton producers in the Banikoara commune of Benin, and a Multinomial Logit model is used to analyze the determinants of this perception.
6	Primates in peril: The significance of Brazil, Madagascar, Indonesia and the Democratic Republic of the Congo for global primate conservation	Estrada, A.; Garber, P.A.; Mittermeier ,R.A.; Wich, S.; Gouveia, S.; Dobrovolski, R.; Nekaris, K.A.I.; Nijman, V.; Rylands, A.B.; Maisels, F.; Williamson, E.A.; Bicca-Marques, J.; Fuentes, A.; Jerusalinsky, L.; Johnson, S.; de Melo, F.R.; Oliveira, L.; Schwitzer, C.; Roos, C.; Cheyne, S.M.; Kierulff, M.C.M.; Raharivololona, B.; Talebi, M.; Ratsimbazafy, J.; Supriatna, J.; Boonratana, R.; Wedana, M.; Setiawan, A.	PeerJ	2018	10.7717/peerj.4869	4	Considering their importance for global primate conservation, we examine the anthropogenic pressures each country is facing that place their primate populations at risk. Habitat loss and fragmentation are main threats to primates in Brazil, Madagascar, and Indonesia.
6	The participatory construction of agro-ecological knowledge as a soil conservation strategy in the mountain region of Rio de Janeiro State (Brazil)	De Assis, R.L.; De Aquino, A.M.	Open Agriculture	2018	10.1515/opag-2018-0002	3	The aim is to expand farmers' perception about the need of implementing agro-ecological practices, mainly soil management practices, which are important for agricultural sustainability in mountainous environments. The study was conducted in a Nova Friburgo family production unit, in the mountain region of Rio de Janeiro State (Brazil).
16	Arctic geopolitics from classical to critical approach – Importance of immaterial factors	Heininen, L.	Geography, Environment, Sustainability	2018	10.24057/2071-9388-2018-11-1-171-186	4	The article aims to draw up a holistic picture of the post-Cold War Arctic, and discuss what might be special features of Arctic geopolitics in globalization. The article examines and discusses the transformation of approach from classical geopolitics to critical geopolitics by applying main approaches of geopolitics to the Arctic/Arctic geopolitics.
6	Impacts of climate change on the municipal water management system in the Kingdom of Bahrain: Vulnerability assessment and adaptation options	Al-Zubari, W.K.; El-Sadek, A.A.; Al-Aradi, M.J.; Al-Mahal, H.A.	Climate Risk Management	2018	10.1016/j.crm.2018.02.002	4	In order to build an adaptive management capacity of the municipal water management system in Bahrain, a number of management interventions are proposed and evaluated, individually and combined, for their effectiveness in enhancing the efficiency of the management system using the developed dynamic model.
6	Climate change-related risks and adaptation strategies as perceived in dairy cattle farming systems in Tunisia	Amamou, H.; Sassi, M.B.; Aouadi, H.; Khemiri, H.; Mahouachi, M.; Beckers, Y.; Hammami, H.	Climate Risk Management	2018	10.1016/j.crm.2018.03.004	3	This study focused on Tunisian dairy farmers' perceptions of the risks and the actions taken to cope with changes attributable to climate change. Using a bottom-up approach, 566 surveys were carried out randomly among dairy farmers throughout Tunisia.
2	Predicting design water requirement of winter paddy under climate change condition using frequency analysis in Bangladesh	Islam, A.R.M.T.; Shen, S.-H.; Yang, S.-B.	Agricultural Water Management	2018	10.1016/j.agwat.2017.10.003	4	The present study aims to simulate climate data based on SRES A1B scenario from the outputs of three General Circulation Models (GCMs) namely, FGOAL, HADCM3 and IPCM4 and examine the design water requirement (DWR) of winter paddy using frequency analysis under climate change condition in Bangladesh.
2	Vulnerability of specialty crops to short-term climatic variability and adaptation strategies in the Midwestern USA	Kistner, E.; Kellner, O.; Andresen, J.; Todey, D.; Morton, L.W.	Climatic Change	2018	10.1007/s10584-017-2066-1	3	In this article, we assess how climate variability and observed climatic trends are impacting Midwestern specialty crop production using USDA Risk Management Agency data.
6	Who Framed Climate Change? Identifying the How and Why of Iowa Corn Farmers' Framing of Climate Change	Houser, M.	Sociologia Ruralis	2018	10.1111/soru.12136	3	To build on this work, this analysis uses qualitative data from 53 Iowa corn farmers to offer a nuanced depiction of the farmers' perception of non-anthropogenic climate change.
6	Assessment of climate change impact on floods from a techno-social perspective	Devkota, R.P.; Bhattarai, U.	Journal of Flood Risk Management	2018	10.1111/jfr3.12192	3	People experiencing first-hand problems related to climate variability such as farmers, foresters, VDC secretaries, school teachers and local non-governmental organisations were invited in the FGDs in order to understand their knowledge of current problems, climate variability and its indicators and their impacts.

1	Analysis of landscape evolution in a vulnerable coastal area under natural and human pressure	Imbrenda, V.; Coluzzi, R.; Lanfredi, M.; Loperte, A.; Satriani, A.; Simoniello, T.	Geomatics Natural Hazards & Risk	2018	10.1080/19475705.2018.1508076	4	We implemented a multidisciplinary study, based on remote sensing and geophysical techniques, landscape ecology tools, and geospatial data analysis for monitoring a coastal area (Basilicata Ionian coast) with a high concentration of forest ecosystems services: five Natura 2000 protected sites, intensive agriculture, and touristic infrastructures.
1	Review: Adaptation of ruminant livestock production systems to climate changes	Henry, B.K.; Eckard, R.J.; Beauchemin, K.A.	Animal	2018	10.1017/S1751731118001301	8	Regional case studies illustrate the benefits and limitations of adaptive management: potential mitigation through heightened awareness of heat stress-related mortality in French cattle; evidence of a drop in milk production in south-eastern Australian dairies during a January 2014 heat wave, from the theoretical potential of 53% to only 10% across the state; and limitations in response options to climate-induced thermal, nutritional and water stress for sheep and goat farmers in northern Ethiopia. Review of research on climate change impacts on ruminant livestock and effective adaptation together with evidence of practical adaptive management provide insights into potential strategies and gaps in knowledge to address challenges and improve future decisions.
1	The Importance of Weather Forecasts and Meteorological Information in Adaptation to Climate Change in Agricultural Production: Some Preliminary Findings	Thoai, T.Q.; Ranola, R.F.; Camacho, L.D.	Philippine Agricultural Scientist	2018		8	This paper provides a synthesis of the issues raised in the literature related to the major role and importance of weather forecast and meteorological information in coping with climate change.
1	Future Scenarios for the Supply and Demand for Fish in the Philippines: Simulations from the AsiaFish Model	Rodriguez, U.P.E.; Ramirez, P.J.B.; Zamora, G.J.; Perez, M.L.; Phillips, M.	Philippine Agricultural Scientist	2018		4	This paper explores future scenarios for the production, consumption, international trade and prices in fish of the Philippines through the year 2035.
10	Local Perceptions of Climate Change Impacts in St. Kitts (Caribbean Sea) and Male, Maldives (Indian Ocean)	Stancioff, C.E.; Stojanov, R.; Kelman, I.; Nemec, D.; Landa, J.; Tichy, R.; Prochazka, D.; Brown, G.; Hofman, C.L.	Atmosphere	2018	10.3390/atmos9120459	3	Does not mention smallholders. This study examines perceptions of climate change and associated environmental and social changes in two SIDS case studies: St. Kitts in the Caribbean Sea and Male Atoll, Maldives in the Indian Ocean.
1	Farmers' Knowledge, Perception and Practices in Apple Pest Management and Climate Change in the Fes-Meknes Region, Morocco	Moinina, A.; Lahlali, R.; MacLean, D.; Boulif, M.	Horticulturae	2018	10.3390/horticulturae4040042	3	Apple production in the Fes-Meknes region of Morocco is highly affected by pests and adverse weather conditions. A survey of apple farmers' knowledge, perceptions and practices (KPP) in pest management and climate change was conducted in spring 2018 in two major apple-producing provinces of the region.
1	On the Barriers to Adaption to Less Water under Climate Change: Policy Choices in Mediterranean Countries	Iglesias, A.; Santillan, D.; Garrote, L.	Water Resources Management	2018	10.1007/s11269-018-2043-0	4	Barriers and constraints to adapting water resources management to climate change in the Mediterranean region are analysed in this paper. First, we analysed the risks to the water resources sector derived from climate change. We then identified the main objective of water adaptation measures: ensuring there is enough water for food, for people, and for ecosystems.
1	Pursuing productivity gains and risk reduction in a multi-hazard landscape: A case study from eastern Uganda	Sullivan-Wiley, K.A.; Gianotti, A.G.S.	Land Use Policy	2018	10.1016/j.landusepol.2018.08.035	4	This study addresses these knowledge gaps by investigating the voluntary adoption of agricultural land management practices among farmers in the Bugisu sub-region in eastern Uganda.
1	Korean traditional beliefs and renewable energy transitions: Pungsu, shamanism, and the local perception of wind turbines	Kim, E.S.; Chung, J.B.; Seo, Y.	Energy Research & Social Science	2018	10.1016/j.erss.2018.07.024	4	Built upon mixed qualitative methods, this research examines the relationship between traditional beliefs and local opposition to wind farms.
1	Bio-Economic Assessment of Climate-Smart Tea Production in the Northern Mountainous Region of Vietnam	Tuong, T.T.; Branca, G.; Arslan, A.; Trinh, M.V.	Asian Journal of Agriculture and Development	2018		4	This study examines climate-smart agriculture potentials in tea production systems in the northern mountainous region of Vietnam.
1	Assessment of projected agro-climatic indices over Awun river basin, Nigeria for the late twenty-first century	Gbangou, T.; Sylla, M.B.; Jimoh, O.D.; Okhimamhe, A.A.	Climatic Change	2018	10.1007/s10584-018-2295-y	4	This paper examines changes in rainfall effectiveness indices of the Awun basin in Nigeria during the late twenty-first century for agricultural applications with outputs from high-resolution regional climate model (RCM) simulations.
1	Grass invasion and drought interact to alter the diversity and structure of native plant communities	Fahey, C; Angelini, C; Flory, SL	Ecology	2018	10.1002/ecy.2536	4	In a 4-yr field experiment, we quantified the individual and interactive effects of invasion by a globally problematic C-4 grass, Imperata cylindrica, and chronic simulated drought imposed by rainout shelters on the whole plant communities of regenerating longleaf pine forest.
1	Perceptions regarding the need for broad sustainability assessments of Australian fisheries	Hobday, AJ; Fleming, A; Ogier, EM; Thomas, L; Hartog, JR; Hornborg, S; Stephenson, RL	Fishieries Research	2018	10.1016/j.fishres.2018.08.006	4	Here we report on the framework development process, including engagement with fishery managers, environmental non-government organisations, and fishery participants. All participants emphasized the need for a broad sustainability assessment with timely reporting, easy availability, and wider coverage of seafood sustainability information than is currently accessible, and expressed the importance of trustworthy and transparent information.
1	Ecosystem services provided by biocrusts: From ecosystem functions to social values	Rodriguez-Caballero, E.; Castro, A.J.; Chamizo, S.; Quintas-Soriano, C.; Garcia-Llorente, M.; Canton, Y.; Weber, B.	Journal of Arid Environments	2018	10.1016/j.jaridenv.2017.09.005	4	In this study, we quantified the direct effect of biocrusts on soil water regulation, erosion control and climate and air quality in two different semiarid ecosystems dominated by biocrusts, and we explored the social importance and perceived vulnerability regarding the capacity of these ecosystems to provide services to society.
1	Assessing the Credibility of the Weather Dependency Framework: Comparing Backcountry Skiers' and Hunters' Perceptions	Verbos, R.I.; Brownlee, M.T.J.	Journal of Park and Recreation Administration	2018	10.18666/JPRA-2018-V36-14-8744	4	This article describes the results of a credibility analysis of the Weather Dependency Framework (WDF; Verbos & Brownlee, 2017), a tool that combines multidimensional weather-related variables to aid in the interpretation of the weather dependency of outdoor recreation activities.
1	Analysis of the nexus between population, water resources and Global Food Security highlights significance of governance and research investments and policy priorities	Yunusa, I.A.M.; Zerihun, A.; Gibberd, M.R.	Journal of the Science of Food and Agriculture	2018	10.1002/jsfa.9126	4	To explore other policy options, we characterized the nexus between GFS and a set of supply or demand factors including population, agricultural and industrial water uses, agricultural publications (as a surrogate for investment in agricultural research and development (R&D)) and corruption perception index (CPI), to reveal opportunities for attaining enduring GFS.
1	Urban green infrastructure and ecosystem services in sub-Saharan Africa	du Toit, M.J.; Cilliers, S.S.; Dallimer, M.; Goddard, M.; Guenat, S.; Cornelius, S.F.	Landscape and Urban Planning	2018	10.1016/j.landurbplan.2018.06.001	4	The general objective of this review is to consolidate research undertaken on urban green infrastructure and the associated ecosystem services in sub-Saharan African cities.
1	The effects of tactical message inserts on risk communication with fish farmers in Northern Thailand	Lebel, L; Lebel, P; Lebel, B; Uppanunchai, A; Duangsuwan, C	Regional Environmental Change	2018	10.1007/s10113-018-1367-x	4	The purpose of this study was to improve understanding of the potential influence of inserting tactical messages into a communication text on the decision behavior of fish farmers with respect to climate-related risks.
1	Rescaling drought mitigation in rural Sri Lanka	Burchfield, E.; Williams, N.E.; Carrico, A.R.	Regional Environmental Change	2018	10.1007/s10113-018-1374-y	4	This paper describes the rescaling of a Sri Lankan drought mitigation practice known as bethma. We focus on the process of rescaling, specifically what is lost and gained when this local practice is implemented at a much larger scale. We identify factors driving participation in bethma and the impacts of this participation on farmer livelihoods.
1	What Defines Livelihood Vulnerability in Rural Semi-Arid Areas? Evidence from Pakistan	Qaisrani, A.; Umar, M.A.; Siyal, G.E.A.; Salik, K.M.	Earth Systems and Environment	2018	10.1007/s41748-018-0059-5	4	This study uses the IPCC Livelihood Vulnerability Index (LVI) approach to analyse the determinants of household livelihood vulnerability defining vulnerability in terms of exposure, sensitivity and adaptive capacity. It also determines various adaptation responses that farmers apply and elucidates the reasons why some farmers choose not to adapt to climate change.

1	Soil-Related Sustainable Development Goals: Four Concepts to Make Land Degradation Neutrality and Restoration Work	Keesstra, S.; Mol, G.; de Leeuw, J.; Okx, J.; Molenaar, C.; de Cleen, M.; Visser, S.	Land	2018	10.3390/land7040133	4	In this paper, we introduce four concepts that we consider to be conducive to realizing LDN in a more integrated way: systems thinking, connectivity, nature-based solutions, and regenerative economics. We illustrate the application of these concepts through three examples in agricultural settings.
1	Temporal and environmental variation in growth and maturity and effects on management reference points of Georges Bank Atlantic cod	Miller, T.J.; O'Brien, L.; Fratantoni, P.S.	Canadian Journal of Fisheries and Aquatic Sciences	2018	10.1139/cjfas-2017-0124	4	Here we show how it can be important to combine state-space models for environmental covariates and demographic rates when evaluating effects of the former on the latter.
1	Consumer Response to Climate Adaptation Strategies in the Food Sector: An Australian Scenario	Ariyawardana, A.; Lim-Camacho, L.; Crimp, S.; Wellington, M.; Somogyi, S.	Ecological Economics	2018	10.1016/j.ecolecon.2018.08.022	4	To understand this issue in more detail, a survey was undertaken of 1532 Australian consumers to investigate how they respond to adaptation strategies in terms of acceptance and willingness to pay.
1	Are current research funding structures sufficient to address rapid Arctic change in a meaningful way?	Ibarguchi, G.; Rajdev, V.; Murray, M.S.	POLAR RESEARCH	2018	10.1080/17518369.2018.1540242	4	Analyses of data on research funding trends (2003-14) in Canada, the USA and the EU indicate that less than 3% of the total budget the funding agencies considered is allocated in any given year to Arctic-related research. Furthermore, alignment is uneven among established scientific research priorities, existing societal needs and projects awarded funding. New support mechanisms and improved alignment among resources, expertise and priorities, including Indigenous research priorities, are vital to planning and adaptation in the face of ongoing Arctic change.
1	Addressing the paradox - the divergence between smallholders' preference and actual adoption of agricultural innovations	Iiyama, M.; Mukuralinda, A.; Ndayambaje, J.D.; Musana, B.S.; Ndoli, A.; Mowo, J.G.; Garrity, D.; Ling, S.; Ruganzu, V.	INTERNATIONAL JOURNAL OF AGRICULTURAL SUSTAINABILITY	2018	10.1080/14735903.2018.1539384	4	This study proposes a cost- and time-effective, easy-to-implement approach to identify farmers' priorities and critical intervention areas, and presents its application in guiding an agroforestry strategy in Rwanda.
1	An integrative methodological framework for setting environmental criteria: Evaluation of stakeholder perceptions	Kim, D.K.; Ramin, M.; Cheng, V.; Javed, A.; Kaluskar, S.; Kelly, N.; Kobiliris, D.; Neumann, A.; Ni, F.; Peller, T.; Perhar, G.; Shimoda, Y.; Visha, A.; Wellen, C.; Yang, C.; Mugalingam, S.; Arhonditsis, G.B.	Ecological Informatics	2018	10.1016/j.ecoinf.2018.08.005	4	In this study, we present an integrative methodological framework that first uses mathematical modelling to reproduce the fundamental relationships between external stressors and ecosystem response and then statistically links the projected patterns with the likelihood to achieve acceptable water quality conditions.
1	Solidarity and the problem of structural injustice in healthcare	Gould, C.C.	Bioethics	2018	10.1111/bioe.12474	4	Article about the concept of solidarity.
1	Challenges in achieving sustainability in Iberian rural areas and small towns: Exploring immigrant stakeholders' perceptions in Alentejo, Portugal, and Emporda, Spain	Moren-Alegret, R.; Fatoric, S.; Wladyka, D.; Mas-Palacios, A.; Fonseca, M.L.	Journal of Rural Studies	2018	10.1016/j.jrurstud.2018.05.005	4	This paper presents the perceptions, experiences and concerns of various international immigrant stakeholders in Southwest Europe regarding the main challenges in achieving sustainability. Its focus is on rural areas and small towns in Alentejo Litoral (Southwest Portugal) and Alt Emporda (Catalonia, Northeast Spain), places where foreign immigration is above the national average.
1	Integrating strategic land use planning in the construction of future land use scenarios and its performance: The Maipo River Basin, Chile	Henriquez-Dole, L.; Uson, T.J.; Vicuna, S.; Henriquez, C.; Gironas, J.; Meza, F.	Land Use Policy	2018	10.1016/j.landusepol.2018.06.045	4	This paper illustrates the integration of political conditionings obtained from a strategic land use plan, into a land change model (LCM) to assess long-term policy impacts using landscape metrics.
1	Landslides and Cropland Abandonment in China's Mountainous Areas: Spatial Distribution, Empirical Analysis and Policy Implications	Deng, X.; Xu, D.D.; Zeng, M.; Qi, Y.B.	Sustainability	2018	10.3390/su10113909	4	This study reveals that factors of the natural environment (e.g., landslides) have steadily and significantly affected cropland abandonment after controlling the factors of the social environment.
1	Coastal landscapes for whom? Adaptation challenges and landscape management in Cornwall	Kopsel, V.; Walsh, C.	Marine Policy	2018	10.1016/j.marpol.2018.05.029	4	We show in this paper that how landscapes are understood by actors in environmental management matters for decision-making. In particular, differentunclerstandings of the Cornish landscape at Godrevy Headland are shown to have material implications for how issues of access, visitor management and long-term responses to climate change and coastal erosion are addressed.
1	Earning a Livelihood From Himalayan Caterpillar Fungus in Kumaon Himalaya: Opportunities, Uncertainties, and Implications	Laha, A.; Badola, R.; Hussain, S.A.	Mountain Research and Development	2018	10.1659/MRD-JOURNAL-D-17-00063.1	4	In the present study, we estimated the mean annual cash income per household in Gori valley, Kumaon Himalaya, and the relative economic contribution of caterpillar fungus. We compared the incomes of caterpillar fungus collectors with those of noncollectors, identified harvest trends from 2009 to 2017, and took stock of people's perceptions regarding this short seasonal occupation.
1	Investigating criteria for valuation of forage resources by local agro-pastoralists in West Africa: using quantitative ethnoecological approach	Naah, J.B.S.N.	Journal of Ethnobiology and Ethnomedicine	2018	10.1186/s13002-018-0261-4	4	This paper provides an insightful quantitative ethnoecological analysis and affirms that agro-pastoralists have a multiplicity of criteria for valuating their natural forage resources. Hence, this study aimed at examining (1) forage resources used for different seasons and livestock types, (2) explicit forage-related valuation criteria and associated salience, and (3) effects of socio-demographic and climatic aridity on local valuation criteria.
1	The perception of water related risks and the state of the water environment in the European Union	Skuras, D.; Tyllianakis, E.	Water Research	2018	10.1016/j.watres.2018.06.045	3	In this work, we examine the factors predicting the perception of three distinct risks, namely Algae growth, Chemical pollution and Changes to ecosystems, to the water environment of each European Union Member State.
1	Risk Perception of Coastal Communities and Authorities on Harmful Algal Blooms in Ecuador	Borbor-Cordova, M.J.; Pozo-Cajas, M.; Cedeno-Montesdeoca, A.; Saltos, G.M.; Kislik, C.; Espinoza-Celli, M.E.; Lira, R.; Ruiz-Barzola, O.; Torres, G.	Frontiers in Marine Science	2018	10.3389/fmars.2018.00365	4	Understanding how specific groups of people in specific places perceive HABs risks is critical for communicating, promoting, and regulating public health measures. This study assessed the knowledge, attitudes, and practices of fishermen, restaurant owners, and coastal authorities in relation to HABs, or 'red tide' events, in coastal Ecuador.
1	Comparing Conservation Attitudes of Park-Adjacent Communities: The Case of Mole National Park in Ghana and Tarangire National Park in Tanzania	Abukari, H.; Mwalyosi, R.B.	Tropical Conservation Science	2018	10.1177/1940082918802757	4	This study compared factors that influence attitudes of local communities toward the conservation of the Tarangire National Park (Tarangire NP) in Tanzania and Mole National Park (Mole NP) in Ghana.
1	A 'deep' aesthetics of contested landscapes: Visions of land use as competing temporalities	Jenkins, J.	Geoforum	2018	10.1016/j.geoforum.2018.07.003	4	This article looks at a proposed rare earth mine in the Black Hills of Wyoming to assess how aesthetic representations and meanings of the forest are situated in the politics of resource access and control.

1	Farmers' livelihood adaptation to environmental change in an arid region: A case study of the Minqin Oasis, northwestern China	Chen, J.; Yin, S.; Gebhardt, H.; Yang, X.J.	Ecological Indicators	2018	10.1016/j.ecolind.2018.05.017	4	We developed an integrated analytical framework for livelihood adaptation and explored the relationships between adaptive capacity, adaptation outcomes, and farmers' adaptation strategies.
1	Late pruning impacts on chemical and sensory attributes of Shiraz wine	Moran, M.A.; Bastian, S.E.; Petrie, P.R.; Sadras, V.O.	Australian Journal of Grape and Wine Research	2018	10.1111/ajgw.12350	4	Our aim was to measure the effects of late pruning on wine chemical and sensory attributes.
30	Dataset on sustainable construction practices of foreign and indigenous construction firms	Faith, A.T.; Fagbenle, O.I.; Amusan, L.M.; Adedeji, A.	Data in Brief	2018	10.1016/j.dib.2018.08.044	4	This dataset conducted a comparative analysis of sustainable construction practices of foreign and indigenous construction firms in Lagos state, Nigeria using a structured questionnaire survey. The dataset contains the level of awareness and consistency of practice of sustainable development on construction projects between the foreign and indigenous construction firms and the impact of implementing sustainable development practices.
1	African crop production trends are insufficient to guarantee food security in the sub-Saharan region by 2050 owing to persistent poverty	Onyutha, C	Food Security	2018	10.1007/s12571-018-0839-7	4	To meet the future food demand, supply should be increased. Crop production in Africa is projected to increase in the future. However, can the crop production trends guarantee future food security? For illustrative analyses, cereal was used on theassumption, following a recent study, that the changes in its production are representative of those for other major food crops.
1	The insight of agricultural adaptation to climate change: a case of rice growers in Eastern Himalaya, India	Rymbai, D.; Sheikh, F.M.	International Journal of Biometeorology	2018	10.1007/s00484-018-1586-3	4	Adaptation is crucial to curb down the negative impact of climate change particularly on agricultural sector. Hence, a study was conducted to identify the strategies adopted by the cereal growers in Eastern Himalaya region of India and determine the factors affecting them.
1	Participatory environmental governance of infrastructure projects affecting reindeer husbandry in the Arctic	Landauer, M.; Komendantova, N.	Journal of Environmental Management	2018	10.1016/j.jenvman.2018.06.049	4	The subject of our research is reindeer herders' participation in EIA procedures of mines and wind farms in Finland because these types of projects affect reindeer husbandry. We study empirically how stakeholders involved in the EIAs perceive the participation of reindeer herders in the planning and implementation of infrastructure projects, and how these differ from the perceptions of the reindeer herders who are affected by the infrastructure projects.
1	Evaluating the demand for aquaculture insurance: An investigation of fish farmers' willingness to pay in central coastal areas in China	Zheng, H.; Mu, H.R.; Zhao, X.	Marine Policy	2018	10.1016/j.marpol.2018.08.021	4	This paper examines the key factors that contribute to the poor performance of fishery insurance, in particular aquaculture insurance, in China.
1	National context is a key determinant of energy security concerns across Europe	Demski, C.; Poortinga, W.; Whitmarsh, L.; Bohm, G.; Fisher, S.; Steg, L.; Umit, R.; Jokinen, P.; Pohjolainen, P.	Nature Energy	2018	10.1038/s41560-018-0235-8	4	Here, we show that cross-country differences in concern about energy security across Israel and 22 countries in Europe are explained by energy-specific and general national contextual indicators, over-and-above individual-level factors that reflect population demographics.
1	Water insecurity, illness and other factors of everyday life: A case study from Choma District, Southern Province, Zambia	Marcantonio, R.A.	Water AS	2018	10.4314/wsa.v44i4.14	4	Given the difficulty in linking illness to a particular source, this research focuses on perceptions of water safety.
1	On the estimation of potential food waste reduction to support sustainable production and consumption policies	Garcia-Herrero, I.; Hoehn, D.; Margallo, M.; Laso, J.; Bala, A.; Batlle-Bayer, L.; Fullana, P.; Vazquez-Rowe, I.; Gonzalez, M.J.; Dura, M.J.; Sarabia, C.; Abajas, R.; Amo-Setien, F.J.; Quinones, A.; Irabien, A.; Aldaco, R.	Food Policy	2018	10.1016/j.foodpol.2018.08.007	4	The methodology proposed in this work allows to quantify FL at the distinct stages of the FSC (agricultural production, postharvest and storage, processing, distribution, households and extradomestic consumption). In addition, economic and nutritional FL are estimated. A Nutritional Food Losses Footprint (NFLF) index is proposed to assess and balance the variables described.
1	Comparison of Ecosystem Services from Mixed and Monospecific Forests in Southwest Germany: A Survey on Public Perception	Almeida, I.; Rosch, C.; Saha, S.	Forests	2018	10.3390/f9100627	4	Based on a survey in Southwest Germany, we analyzed stakeholders' and citizens' perceptions of ecosystem services of monospecific and mixed forests of silver fir and beech.
1	Local understanding of disaster risk and livelihood resilience: The case of rice smallholders and floods in Ecuador	Galarza-Villamar, J.A.; Leeuwis, C.; Pila-Quinga, G.M.; Cecchi, F.; Parraga-Lema, C.M.	International Journal of Disaster Risk Reduction	2018	10.1016/j.ijdrr.2018.08.009	4	On the premise that a system's resilience is partially a function of its capability to manage risk, this paper systematically presents a step-by-step process to develop and apply a participatory risk assessment as an approximate way to better understand livelihood resilience from a local perspective, specifically within the context of rice smallholders located in flood-prone areas in Ecuador.
1	The Role of Indigenous and Traditional Knowledge in Ecosystem-Based Adaptation: A Review of the Literature and Case Studies from the Pacific Islands	Nalau, J.; Becken, S.; Schliephack, J.; Parsons, M.; Brown, C.; Mackey, B.	Weather Climate and Society	2018	10.1175/WCAS-D-18-0032.1	4	This paper critically reviews EbA literature and provides empirical examples from Vanuatu and Samoa to demonstrate the different ways ITK relates to EbA projects.
1	Transformation of degraded farmlands to agroforestry in Zongi Village, Ethiopia	Chiemela, S.N.; Noulekoun, F.; Zenebe, A.; Abadi, N.; Birhane, E.	Agroforestry Systems	2018	10.1007/s10457-017-0076-7	4	The interaction of human land use, steep slopes and erosion has been a serious threat to Ethiopia's ecosystems. Community's initiated land rehabilitation programmes such as tree regeneration on farm lands, hill-side planting and exclosures have been established to rejuvenate debilitated lands. To characterize, map out and monitor such transformations, this study was carried out in Zongi, Tigray Region of northern Ethiopia
1	Who trusts whom in the Great Barrier Reef? Exploring trust and communication in natural resource management	MacKeracher, T.; Diedrich, A.; Gurney, G.G.; Marshall, N.	Environmental Science & Policy	2018	10.1016/j.envsci.2018.06.010	4	Using Australia's Great Barrier Reef (GBR) as a case study, we investigated to what degree stakeholders trust reef-related information from five sources: research institutions, non-government organizations (NGOs), the Great Barrier Reef Marine Park Authority (GBRMPA), industry groups, and friends, family and coworkers.
1	Production Risks, Risk Preference and Contract Farming: Impact on Food Security in India	Mishra, A.K.; Kumar, A.; Joshi, P.K.; D'Souza, A.	Applied Economic Perspectives and Policy	2018	10.1093/aepp/ppy017	4	This article reviews the literature on contract farming (CF) in India and assesses the impact of smallholders' perceived production risks on the adoption of CF; the impact of CF on smallholders' food security; and its impact on employment generation in their farming enterprises.
1	Awareness and Practices Relating to Zoonotic Diseases Among Smallholder Farmers in Nepal	Kelly, T.R.; Bunn, D.A.; Joshi, N.P.; Grooms, D.; Devkota, D.; Devkota, N.R.; Paudel, L.N.; Roug, A.; Wolking, D.J.; Mazet, J.A.K.	Ecohealth	2018	10.1007/s10393-018-1343-4	4	We conducted a cross-sectional study to investigate Nepali farmers' awareness of zoonoses, assess current health challenges, and evaluate disease prevention and control practices.

1	Capturing complexity: Forests, decision-making and climate change mitigation action	Klapwijk, M.J.; Boberg, J.; Bergh, J.; Bishop, K.; Bjorkman, C.; Ellison, D.; Felton, A.; Lidskog, R.; Lundmark, T.; Keskitalo, E.C.H.; Sonesson, J.; Nordin, A.; Nordstrom, E.M.; Stenlid, J.; Marald, E.	Global Environmental Change-Human and Policy Dimensions	2018	10.1016/j.gloenvcha.2018.07.012	4	To examine the level of dispersion and to obtain a holistic view, we review climate change mitigation in the context of Swedish forest research. We introduce a heuristic framework to understand decision-making connected to climate change mitigation. We apply our framework to two themes which span different dimensions in the socio-ecological system: carbon accounting and bioenergy.
1	A sustainable supply chain for organic, conventional agro-food products: The role of demand substitution, climate change and public health	Sazvar, Z.; Rahmani, M.; Govindan, K.	Journal of Cleaner Production	2018	10.1016/j.jclepro.2018.04.118	4	The aim of this study is to develop and analyze a multi-objective linear mathematical model for a sustainable supply chain with an agro-food deteriorating product.
1	Climate Vulnerability in Rainfed Farming: Analysis from Indian Watersheds	Sathyan, A.R.; Funk, C.; Aenis, T.; Breuer, L.	Sustainability	2018	10.3390/su10093357	4	We, therefore, established a comprehensive, location-specific, bottom-up tool to analyse and compare the climate vulnerability of watershed areas. For this, we deducted a new Climate Vulnerability Index for Rainfed Tropics (CVIRFT) to evaluate the potential effectiveness of programmes to adapt to climate change impacts.
1	Provision of Climate Services for Agriculture Public and Private Pathways to Farm Decision-Making	Haigh, T.; Koundinya, V.; Hart, C.; Klink, J.; Lemos, M.; Mase, A.S.; Prokopy, L.; Singh, A.; Todey, D.; Widhalm, M.	Bulletin of the American Meteorological Society	2018	10.1175/BAMS-D-17-0253.1	4	This study characterizes the various channels of climate information flow, as well as the needs and preferences of information intermediaries and end users. We use data from a 2016 survey of farmers and agricultural advisors in 12 U.S. Corn Belt states to evaluate perceptions of climate information and its usability.
1	Gender and Cross-Scale Differences in the Perception of Social-Ecological Systems	Delgado-Serrano, M.M.; Semerena, R.E.	Sustainability	2018	10.3390/su10092983	4	In this research, we analyzed the gender and across scales differences in the perception of a SES and unveiled the potential reasons that shape the different actors' understanding. Using structural analysis tools, we analyzed the perceptions of local women, local men, and external stakeholders on the most relevant variables shaping the actual and future sustainable management of a SES.
7	Impacts of Socio-Psychological Factors on Actual Adoption of Sustainable Land Management Practices in Dryland and Water Stressed Areas	Zeweld, W.; Van Huylenbroeck, G.; Tesfay, G.; Azadi, H.; Speelman, S.	Sustainability	2018	10.3390/su10092963	4	This paper investigates how socio-psychological factors-such as social capital, information, attitudes, efficacy, and aversion-affect smallholder farmers' decisions to adopt sustainable land management practices, such as agroforestry systems, organic compost, and crop rotation with legumes.
1	Branding Instead of Product Innovation: A Study on the Brand Personalities of the UK's Electricity Market	Rutter, R.; Chalvatzis, K.J.; Roper, S.; Lettice, F.	European Management Review	2018	10.1111/emre.12155	4	This study examines the use of corporate branding to enhance differentiation and specifically examines the influence of brand consistency and brand personality on the retention of customers.
1	Perception and adaptation strategies of rural people against the adverse effects of climate variability: A case study of Boset District, East Shewa, Ethiopia	Moroda, G.T.; Tolossa, D.; Semie, N.	Environmental Development	2018	10.1016/j.envdev.2018.07.005	3	Does not mention smallholders. This study explores the perception and adaptation strategies of rural households to the adverse effects of climate variability.
1	Opposition overblown? Community response to wind energy siting in the Western United States	Giordono, L.S.; Boudet, H.S.; Karmazina, A.; Taylor, C.L.; Steel, B.S.	Energy Research & Social Science	2018	10.1016/j.erss.2018.05.016	4	This focus has led to an emphasis on the so-called "social gap" between positive general attitudes toward renewable energy development and local resistance to actual proposals. Instead, we conduct a fuzzy set/Qualitative Comparative Analysis of 53 proposals for wind energy development in the Western United States to better understand both the amount of local opposition and the factors and processes that shape it.
1	Recreational fishers' perceptions and behaviour towards cultural ecosystem services in response to the Nerbioi estuary ecosystem restoration	Pouso, S.; Uyarra, M.C.; Borja, A.	Estuarine Coastal and Shelf Science	2018	10.1016/j.ecss.2018.04.033	4	In recent decades, recorded biotic and abiotic parameters show a clear ecological improvement, but the concurrent response of cultural ecosystem services (e.g. recreational fishing) remains unexplored. Recreational fishers' fishing behaviour and perceptions over environmental changes were obtained through a questionnaire and compared with recorded parameters of improvement.
1	Multidecadal, county-level analysis of the effects of land use, Bt cotton, and weather on cotton pests in China	Zhang, W.; Lu, Y.H.; van der Werf, W.; Huang, J.K.; Wu, F.; Zhou, K.; Deng, X.Z.; Jiang, Y.Y.; Wu, K.M.; Rosegrant, M.W.	Proceedings of the National Academy of Sciences of the United States of America	2018	10.1073/pnas.1721436115	4	This study examines panel data on land use, adoption of genetically modified Bacillus thuringiensis (Bt) insect-resistant cotton, weather, pest severity, and insecticide use on three major cotton pests for 51 counties in China during 1991-2015. Bt cotton had pervasive effects on the whole pest complex in cotton and its management.
1	Strengthening climate change adaptation capacity in Africa-case studies from six major African cities and policy implications	Leal, W.; Balogun, A.L.; Ayal, D.Y.; Bethurem, E.M.; Murambadoro, M.; Mambo, J.; Taddese, H.; Tefera, G.W.; Nagy, G.J.; Fudjumdjum, H.; Mugabe, P.	Environmental Science & Policy	2018	10.1016/j.envsci.2018.05.004	6	Study in African cities
1	Farmers' perceptions of and adaptations to drought in Herat Province, Afghanistan	Iqbal, M.W.; Donjadee, S.; Kwanyuen, B.; Liu, S.Y.	Journal of Mountain Science	2018	10.1007/s11629-017-4750-z	3	Does not mention smallholders. The objective of this study was to explore farmers' perceptions of the drought's prevalence and characteristics, its socioeconomic and environmental impacts, their strategies for coping with and mitigating it, and types of conflicts and resolution mechanisms. A questionnaire was completed by 147 farming households.
1	Farmers' perceptions and adaptation behaviours concerning land degradation: A theoretical framework and a case-study in the Qinghai-Tibetan Plateau of China	Liu, K.; Huisingh, D.; Zhu, J.M.; Ma, Y.; O'Connor, D.; Hou, D.Y.	Land Degradation & Development	2018	10.1002/ldr.3011	4	To better understand farmers' perceptions of land degradation and their corresponding adaptation behaviour, this paper presents a theoretical framework to explain the interactions among awareness, perception, mitigation, and adaptation, and tests the framework using a case-study. A case-study was conducted in Qinghai, where historical environmental pollution from a chemical plant had caused the contamination of soil, groundwater, and river water, which had negatively impacted the livelihood of local farmers.
1	Flood hazards: household vulnerability and resilience in disaster-prone districts of Khyber Pakhtunkhwa province, Pakistan	Shah, A.A.; Ye, J.Z.; Abid, M.; Khan, J.; Amir, S.M.	Natural Hazards	2018	10.1007/s11069-018-3293-0	4	This research elaborates household vulnerability and resilience to flood disaster within two districts within Pakistan.
1	Resilient Smart Gardens-Exploration of a Blueprint	Penzenstadler, B.; Khakurel, J.; Plojo, C.J.; Sanchez, M.; Marin, R.; Tran, L.	Sustainability	2018	10.3390/su10082654	4	We set up a student team project that created a safe space for exploring this multidisciplinary domain. We developed a smart resilient garden kit with Internet-of-Things devices that is easy to rebuild and scale. We use a small-scale board and a number of sensors connected to a planter. In this paper, we report on a prototypical implementation for multidisciplinary smart garden projects, our experiences with self-guided implementation and reflection meetings, and our lessons learned.
1	Socio-cultural diversity and public preferences for coral reef management options in Indonesia	Halik, A.; Verweij, M.	Ocean & Coastal Management	2018	10.1016/j.ocecoaman.2017.08.012	4	This paper aims to uncover people's cultural biases, and to investigate the plurality of their perceptions, using the case of coral reef protection
1	Shifting settler-colonial discourses of environmentalism: Representations of indigeneity and migration in Australian conservation	van Holstein, E.; Head, L.	Geoforum	2018	10.1016/j.geoforum.2018.06.005	4	This paper approaches those two types of othering together in the context of environmental debate, using the lens of a mainstream conservation magazine. We analyse representations of indigeneity and migration in a shifting settler-colonial discourse on the environment, throughout the 45 volumes of the Australian Conservation Foundation's magazine Habitat (1973-2016).

1	Land Use Changes in Dharmasraya District, West Sumatra, Indonesia	Yurike; Yonariza; Febriamansyah, R.; Karimi, S.	Pertanika Journal of Tropical Agricultural Science	2018		4	This study was motivated by high deforestation rates in Dharmasraya, West Sumatra, Indonesia and a desire to test the assumption that poverty was driving this. Using a mixture of primary and secondary data and drawing heavily on 250 interviews with households living in and around the forest in Dharmasraya, this study describes the context, the forest clearing technique used by households, and analyses what drives deforestation in Dharmasraya.
1	The trouble with cover crops: Farmers' experiences with overcoming barriers to adoption	Roesch-McNally, G.E.; Basche, A.D.; Arbuckle, J.G.; Tyndall, J.C.; Miguez, F.E.; Bowman, T.; Clay, R.	Renewable Agriculture and Food Systems	2018	10.1017/S1742170517000096	3	Focus groups were conducted across the Corn Belt state of Iowa to better understand how farmers confront barriers to cover crop adoption in highly intensive agricultural production systems.
1	Drought, Local Institutional Contexts, and Support for Violence in Kenya	Linke, A.M.; Witmer, F.D.W.; O'Loughlin, J.; McCabe, J.T.; Tir, J.	Journal of Conflict Resolution	2018	10.1177/0022002717698018	4	We address two questions on the effects of climate change for social instability. First, do droughts and their associated environmental impacts affect support for the use of violence? Second, do local-level formal and informal institutions moderate support for violence when and where droughts worsen? To answer these questions, we conducted a national survey of 1,400 Kenyans in 2014.
1	Where are the drought tolerant crops? An assessment of more than two decades of plant biotechnology effort in crop improvement	Nuccio, M.L.; Paul, M.; Bate, N.J.; Cohn, J.; Cutler, S.R.	Plant Science	2018	10.1016/j.plantsci.2018.01.020	4	Advances in the biology of plant water management, including response to water deficit reveal new opportunities to improve crop response to water deficit and new genome-based tools promise to usher in the next era of crop improvement. As biotechnology looks to improve crop productivity under drought conditions, the environmental and food security advantages will influence public perception and shift the debate toward benefits rather than risks.
1	Unpacking local impacts of climate change: learning with a coastal community in Central Vietnam	Trung, N.H.	Natural Hazards	2018	10.1007/s11069-018-3292-1	3	Does not mention smallholders. Through a case study that involved residents of a coastal community in Central Vietnam, this paper presents how local people perceive climate change and characterize climate impacts on their life.
1	Gender lessons for climate initiatives: A comparative study of REDD plus impacts on subjective wellbeing	Larson, A.M.; Solis, D.; Duchene, A.E.; Atmadja, S.; Resosudarmo, I.A.P.; Dokken, T.; Komalasari, M.	World Development	2018	10.1016/j.worlddev.2018.02.027	4	This article uses data from a longitudinal study of subnational REDD+ initiatives in six countries to analyze their gendered impact on perceived wellbeing. Comparative research on subjective wellbeing was conducted at 62 villages participating in 16 REDD+ initiatives and 61 control villages at two periods in time, using a before-after-control-intervention (BACI) design.
1	Pathways of adaptation to external stressors in coastal natural-resource-dependent communities: Implications for climate change	Fischer, A.P.	World Development	2018	10.1016/j.worlddev.2017.12.007	3	This paper presents an investigation of how six historically natural-resource-dependent coastal communities in Oregon, USA, have experienced and responded to external stressors and how adaptation in these communities has been shaped by interactions between past and present practices, processes, and vulnerabilities.
1	Assessing multi-level drivers of adaptation to climate variability and water insecurity in smallholder irrigation systems	McCord, P.; Waldman, K.; Baldwin, E.; Dell'Angelo, J.; Evans, T.	World Development	2018	10.1016/j.worlddev.2018.02.009	4	In this study we investigate smallholder adaptation in Kenya from multiple levels. Specifically, we identify the role of household- and community-level characteristics in shaping smallholder experimentation with different seed varieties.
1	Stakeholders' assessment of dike-protected and flood-based alternatives from a sustainable livelihood perspective in An Giang Province, Mekong Delta, Vietnam	Tran, D.D.; van Halsema, G.; Hellegers, P.J.G.J.; Ludwig, F.; Seijger, C.	Agricultural Water Management	2018	10.1016/j.agwat.2018.04.039	4	This paper explores stakeholders' perceptions and appreciation of these contrasting farming and livelihood systems for the upper delta. It also examines the extent that alternatives to flood-based agricultural systems are viewed as feasible and attractive.
1	The world's first carbon neutral coffee: Lessons on certification and innovation from a pioneer case in Costa Rica	Birkenberg, A.; Birner, R.	Journal of Cleaner Production	2018	10.1016/j.jclepro.2018.03.226	4	The paper analyses how the cooperative came to apply this certification, which challenges it faced and how the cooperative solved them.
1	Rural Households' Livelihood Capital, Risk Perception, and Willingness to Purchase Earthquake Disaster Insurance: Evidence from Southwestern China	Xu, D.D.; Liu, E.L.; Wang, X.X.; Tang, H.; Liu, S.Q.	International Journal of Environmental Research and Public Health	2018	10.3390/ijerph15071319	6	However, few studies have examined the perspectives of rural households, in order to explore the correlations between the rural households' livelihood capital, their disaster risk perception, and their willingness to purchase earthquake disaster insurance. A cross-sectional survey data including 241 rural households from the most severe disaster counties (cities) during the 5 center dot 12 Wenchuan earthquake was examined with regard to rural households' livelihood and disaster risk perception, and ordinal logistic regression models were constructed to explore rural households' willingness to purchase earthquake disaster insurance, as well as the driving mechanism behind this willingness.
1	Risk Propagation in Spate Irrigation Systems: A Case Study from Sudan	Fadul, E.; De Fraiture, C.; Masih, I.	Irrigation and Drainage	2018	10.1002/ird.2218	3	Does not mention smallholders. Using the Source-Pathways-Receptor and Consequence (SPRC) framework, this paper explores the sources of risks, propagation pathways, risk perceptions and consequences for the farmers, water users' associations (WUAs) and water managers in the Gash Agricultural Scheme in Sudan.
1	'Wildlife officials only care about animals': Farmers' perceptions of a Ministry-based extension delivery system in mitigating human-wildlife conflicts in the Okavango Delta, Botswana	Noga, S.R.; Kolawole, O.D.; Thakadu, O.T.; Masunga, G.S.	Journal of Rural Studies	2018	10.1016/j.jrurstud.2018.06.003	4	This study examined the influence of a Ministry-based extension system on community-based, problem animal control and perceptions among local arable farmers at the eastern Okavango Panhandle in northern Botswana.
1	Utilization of 'early green harvest' and non-Saccharomyces cerevisiae yeasts as a combined approach to face climate change in winemaking	Teslic, N.; Patrignani, F.; Ghidotti, M.; Parpinello, G.P.; Ricci, A.; Tofalo, R.; Lanciotti, R.; Versari, A.	European Food Research and Technology	2018	10.1007/s00217-018-3045-0	4	Present study aimed to ascertain whether the combination of two factors, i.e., time of harvest and type of yeast, can significantly moderate the effect of climate change on Chardonnay wine composition.
7	Assessment of nutrient recovery, air emission and farmers' perceptions of indigenous mound burning practice using animal and human wastes in Myanmar	Ngone, M.H.; Koottatep, T.; Fakkaew, K.; Polprasert, C.	Agriculture Ecosystems & Environment	2018	10.1016/j.agee.2018.02.033	4	Hence, mound or heap burning, an indigenous agricultural practice which is currently being conducted in some remote areas in the eastern part of Myanmar and other less developed countries in Asia and Africa, was studied in this research. In traditional mound burning (MB) practice in Myanmar, dried cow dung (CD) is burnt and covered with soil to form a mound.
1	Evaluating the ecological and social targeting of a compensation scheme in Bangladesh	Bladon, A.J.; Mohammed, E.Y.; Hossain, B.; Kibria, L.; Ali, L.; Milner-Gulland, E.J.	Plos One	2018	10.1371/journal.pone.0197809	4	Analysing data from a household survey of compensation recipients and non-recipients, we identify the current correlates of compensation distribution and explore perceptions of fairness in this distribution.
1	Stakeholder perceptions of the outcomes of reforms on the performance and sustainability of the cotton sector in Ghana and Burkina Faso: A tale of two countries	Boafo, Y.A.; Balde, B.S.; Saito, O.; Gasparatos, A.; Lam, R.D.; Ouedraogo, N.; Chamba, E.; Moussa, Z.P.	Cogent Food & Agriculture	2018	10.1080/23311932.2018.1477541	4	This study investigates the outcomes of reforms on the performance of the cotton sector in Ghana and Burkina Faso. These structural and policy reforms have been aimed at promoting competition and enhancing productivity, largely under the pressure of external donor agencies. The study draws on in-depth semi-structured interviews with stakeholders involved in different aspects of cotton value chains in the two countries.
1	How communication with teachers, family and friends contributes to predicting climate change behaviour among adolescents	Valdez, R.X.; Peterson, M.N.; Stevenson, K.T.	ENVIRONMENTAL CONSERVATION	2018	10.1017/S0376892917000443	3	To better understand how communication with teachers, friends and family, climate change knowledge and climate change concern predict climate change behaviour, we administered a survey to a random sample of middle school students in North Carolina, USA (n = 1371).

1	Farming adaptations in the face of climate change	Castellano, R.L.S.; Moroney, J.	Renewable Agriculture and Food Systems	2018	10.1017/S174217051700076X	4	Utilizing a framework which draws from research examining how farmers' climate change beliefs and experiences affect their adaptation strategies, and research on farm succession and adaptation at the rural-urban interface (RUI), we ask 'How do climate change beliefs and different farm attributes (particularly the presence of an heir and location at the RUI) affect adaptation strategies?
1	Knowledge and management of soil fertility by farmers in western Cameroon	Kome, G.K.; Enang, R.K.; Yerima, B.P.K.	Geoderma Regional	2018	10.1016/j.geodrs.2018.02.001	4	This study was conducted to assess farmers' perceptions of soil fertility, identify major soil fertility management (SFM) practices and to evaluate the effects of dominant SFM practices on soil quality.
1	Farmers' Trust in Sources of Production and Climate Information and Their Use of Technology	Borrelli, K.A.; Roesch-McNally, G.E.; Wulfhorst, J.D.; Eigenbrode, S.D.; Yorgey, G.G.; Kruger, C.E.; Houston, L.L.; Bernacchi, L.A.; Mahler, R.L.	Journal of Extension	2018		3	A regionally representative survey of 900 Inland Pacific Northwest farmers showed that farmers trust other farmers and agribusiness most for production management decisions but trust university Extension most for climate change information.
1	Factors influencing hybrid maize farmers' risk attitudes and their perceptions in Punjab Province, Pakistan	Akhtar, S.; Li, G.C.; Ullah, R.; Nazir, A.; Igba, M.A.; Raza, M.H.; Iqbal, N.; Faisal, M.	Journal of Integrative Agriculture	2018	10.1016/S2095-3119(17)61796-9	3	This study aims to quantify hybrid maize farmers' perceptions of disastrous risks, their attitudes towards risk and to explore the impacts of various farm and farm household factors on farmers' risk attitudes and risk perceptions. The present study is conducted in four hybrid maize growing districts of Punjab Province, Pakistan, using cross-sectional data of 400 hybrid maize farmers.
1	Gender in the jungle: a critical assessment of women and gender in current (2014-2016) forestry research	Asher, K.; Varley, G.	International Forestry Review	2018	10.1505/146554818823767537	8	This paper assesses the uptake of women and gender issues in recent (2014-2016) forestry research. We found that women and gender concerns are still largely absent or inadequately addressed in forestry research published in scientific journals.
1	Assessing Coping Strategies in Response to Drought: A Micro Level Study in the North-West Region of Bangladesh	Mardy, T.; Uddin, M.N.; Sarker, M.A.; Roy, D.; Dunn, E.S.	Climate	2018	10.3390/cli6020023	4	The purpose of this study was to assess farmers' coping strategies for droughts by identifying which strategies are used and the influencing factors.
1	Insights into individual and cooperative invasive plant management on family forestlands	Ma, Z.; Clarke, M.; Church, S.P.	Land Use Policy	2018	10.1016/j.landusepol.2018.02.010	3	Building upon a broader literature on family forest owner decision making and invasive weed management in non-forested landscapes, we conducted 23 semi-structured interviews with family forest owners and forestry professionals in Indiana, USA.
1	Vulnerabilities of Southwestern US Rangeland-based animal agriculture to climate change	Havstad, K.M.; Brown, J.R.; Estell, R.; Elias, E.; Rango, A.; Steele, C.	Climatic Change	2018	10.1007/s10584-016-1834-7	4	Article about: The Southwestern US is a five-state region that has supported animal agriculture since the late 16th Century when European settlers crossed the Rio Grande into present day west Texas and southern New Mexico with herds of cattle, sheep, goats and horses. For the past 400 years the rangeland livestock industry, in its many forms and manifestations, has developed management strategies and conservation practices that impart resilience to the climatic extremes, especially prolonged droughts, that are common and extensive across this region.
1	Vulnerability of California specialty crops to projected mid-century temperature changes	Kerr, A.; Dialesandro, J.; Steenwerth, K.; Lopez-Brody, N.; Elias, E.	Climatic Change	2018	10.1007/s10584-017-2011-3	4	This paper describes the temperature sensitivity and exposure of selected specialty crops in California.
1	Framing nature: visual representations of ecological paradigms	Franzen, S.M.	Renewable Agriculture and Food Systems	2018	10.1017/S174217051700059X	4	This paper provides a brief discussion on the implications and outcomes of ethnographic filmmaking as a means to understanding environmental perception among farming communities.
1	Correlating drought conservation practices and drought vulnerability in a tropical agricultural system	Alvarez-Berrios, N.L.; Soto-Bayo, S.; Holupchinski, E.; Fain, S.J.; Gould, W.A.	Renewable Agriculture and Food Systems	2018	10.1017/S174217051800011X	4	In this study, we assessed the geographic extent of agricultural conservation practices incentivized by US Department of Agriculture Natural Resources Conservation Service (NRCS) and evaluated their large-scale contribution to drought adaptability. We identified concentrations of drought-related practices (e.g. cover crops, ponds) applied between 2000 and 2016.
1	Do advisors perceive climate change as an agricultural risk? An in-depth examination of Midwestern US Ag advisors' views on drought, climate change, and risk management	Church, S.P.; Dunn, M.; Babin, N.; Mase, A.S.; Haigh, T.; Prokopy, L.S.	Agriculture and Human Values	2018	10.1007/s10460-017-9827-3	3	Through the lens of the Health Belief Model and Protection Motivation Theory, we analyzed interviews of 36 agricultural advisors in Indiana and Nebraska to understand their appraisals of climate change risk, related decision making processes and subsequent risk management advice to producers.
1	Diagnosing climate change impacts and identifying adaptation strategies by involving key stakeholder organisations and farmers in Sikkim, India: Challenges and opportunities	Azhoni, A.; Goyal, M.K.	Science of the Total Environment	2018	10.1016/j.scitotenv.2018.01.112	4	This research aims to narrow this gap by matching the adaptation strategies being framed by policy makers to that of the perspectives of development agencies, researchers and farmers in the Himalayan state of Sikkim in India.
1	Public perceptions towards oil palm cultivation in Tabasco, Mexico	Pischke, E.C.; Rouleau, M.D.; Halvorsen, K.E.	Biomass & Bioenergy	2018	10.1016/j.biombioe.2018.02.010	4	We present findings from a survey of Tabasco, Mexico, that focuses on community perceptions of local oil palm plantations, their impacts, and expansion potential in a major oil palm cultivation region.
1	Managed Realignment (MR) along the Eastern German Baltic Sea: A Catalyst for Conflict or for a Coastal Zone Management Consensus	de la Vega-Leinert, A.C.; Stoll-Kleemann, S.; Wegener, E.	Journal of Coastal Research	2018	10.2112/JCOASTRES-D-15-00217.1	4	In this study, participatory qualitative research methods were used to investigate stakeholders' perceptions and preferences with regard to coastal land management strategies on the eastern German Baltic coast in the state of Mecklenburg-Western Pomerania.
1	Social fit of coral reef governance varies among individuals	Turner, R.A.; Forster, J.; Fitzsimmons, C.; Gill, D.; Mahon, R.; Peterson, A.; Stead, S.	Conservation Letters	2018	10.1111/conl.12422	4	This study highlights how knowledge of institutional acceptance can inform the design of more targeted interventions that enhance the social fit of conservation governance to local contexts and diverse resource users.
1	Perspectives on solar geoengineering from Finnish Lapland: Local insights on the global imaginary of Arctic geoengineering	Buck, H.J.	Geoforum	2018	10.1016/j.geoforum.2018.02.020	3	This paper synthesizes perspectives from extended interviews with citizen stakeholders in Finnish Lapland. Rather than approaching solar geoengineering from the perspective of Arctic or local interests, respondents took a global view of its prospects and governance.
1	Impact of land cover change on aboveground carbon stocks in Afromontane landscape in Kenya	Pellikka, P.K.E.; Heikinheimo, V.; Hietanen, J.; Schafer, E.; Siljander, M.; Heiskanen, J.	Applied Geography	2018	10.1016/j.apgeog.2018.03.017	4	The impact of land cover change on tree aboveground carbon stocks was studied in Taita Hills, Kenya.
1	Hydration Status, Kidney Function, and Kidney Injury in Florida Agricultural Workers	Mix, J.; Elon, L.; Mac, V.V.T.; Flocks, J.; Economos, E.; Tovar-Aguilar, A.J.; Hertzberg, V.S.; McCauley, L.A.	Journal of Occupational and Environmental Medicine	2018	10.1097/JOM.0000000000001261	3	We examined hydration status and kidney function in 192 Florida agricultural workers.
1	Local level impacts of climatic and non-climatic factors on agriculture and agricultural land-use dynamic in rural northern Ghana	Badmos, B.K.; Villamor, G.B.; Agodzo, S.K.; Odai, S.N.; Badmos, O.S.	Singapore Journal of Tropical Geography	2018	10.1111/sjtg.12236	3	Does not mention smallholders. This study investigated the local level impacts of climatic and non-climatic factors on the agricultural land-use dynamic in rural northern Ghana.
1	Drivers of mangrove ecosystem service change in the Sundarbans of Bangladesh	Islam, M.M.; Sunny, A.R.; Hossain, M.M.; Friess, D.A.	Singapore Journal of Tropical Geography	2018	10.1111/sjtg.12241	4	This study aimed to identify the natural and anthropogenic drivers of change that affect ecosystem services of the Sundarbans mangrove forest. Secondary data analysis and primary fieldwork were conducted in three districts in the Sundarbans region of Bangladesh to understand ecosystem service usage and the perceptions of local resource users.

1	An Integrative Methodological Framework for Setting Environmental Criteria: Evaluation of Public Preferences	Ramin, M.; Cheng, V.Y.S.; Kim, D.K.; Ni, F.J.; Javed, A.; Kelly, N.E.; Yang, C.; Midlane-Jones, S.; Mugalingam, S.; Arhonditsis, G.B.	Ecological Economics	2018	10.1016/j.ecolecon.2018.01.009	4	The main objective of the present study is to introduce public preferences into the development of water-quality criteria that effectively balance environmental concerns and socioeconomic values.
1	Prepared and flexible: Local adaptation strategies for avalanche risk	Hovelsrud, G.K.; Karlsson, M.; Olsen, J.	Cogente Social Sciences	2018	10.1080/23311886.2018.1460899	4	This paper illustrates the interplay and dynamics of adaptive capacity and social capital through locally developed adaptation strategies to avalanche risk in two case areas in Northern Norway.
1	Reducing risks by transforming landscapes: Cross-scale effects of land-use changes on ecosystem services	Fedele, G.; Locatelli, B.; Djoudi, H.; Colloff, M.J.	Plos One	2018	10.1371/journal.pone.0195895	4	We assessed how rural communities in two forested landscapes in Indonesia have changed land uses over the last 20 years to adapt their livelihoods that were at risk from multiple hazards. We estimated the impact of these adaptation strategies on the supply of ecosystem services by comparing different benefits provided to people from these land uses (products, water, carbon, and biodiversity), using forest inventories, remote sensing, and interviews.
1	Geographical and temporal patterns of rabies post exposure prophylaxis (PEP) incidence in humans in the Mekong River Delta and Southeast Central Coast regions in Vietnam from 2005 to 2015	Lee, H.S.; Thiem, V.D.; Anh, D.D.; Duong, T.N.; Lee, M.; Grace, D.; Nguyen-Viet, H.	Plos One	2018	10.1371/journal.pone.0194943	4	Therefore, the main objective of this study was to assess the geographical and temporal distributions of rabies post exposure prophylaxis (PEP) incidence in humans in Vietnam from 2005 to 2015.
1	A change in the wind? US public views on renewable energy and climate compared	Hamilton, L.C.; Bell, E.; Hartter, J.; Salerno, J.D.	Energy Sustainability and Society	2018	10.1186/s13705-018-0152-5	4	We explore similarities and differences in views of renewable energy and climate change using a unique collection of 18 US national or regional surveys totaling more than 14,000 interviews, conducted between 2011 and 2017. I
1	Understanding roles and functions of cattle breeds for pastoralists in Benin	Tamou, C.; de Boer, I.J.M.; Ripoll-Bosch, R.; Oosting, S.J.	Livestock Science	2018	10.1016/j.livsci.2018.02.013	4	The objectives of this study were to: i) inventorise indigenous breeds of cattle and their performance in selected traits, ii) analyse pastoralists' preferences for specific breeds and reasons for that, and iii) determine whether the knowledge about breeds and their traits was transmitted across generations and was consistent across agro-ecological zones.
1	Effects of livestock grazing on key vegetation attributes of a remnant forest reserve: The case of Desa'a Forest in northern Ethiopia	Giday, K.; Humnessa, B.; Muys, B.; Taheri, F.; Azadi, H.	Global Ecology and Conservation	2018	10.1016/j.gecco.2018.e00395	4	The study was conducted in Desa'a Forest with the objective of investigating livestock-forest interaction. This study also evaluated the grazing pressure on Desa'a Forests from livestock, the potential of forests biomass feed production and current livestock density relation to the sustainable stocking rate.
1	Perceptions of Cyclone Preparedness: Assessing the Role of Individual Adaptive Capacity and Social Capital in the Wet Tropics, Australia	Sandanam, A.; Diedrich, A.; Gurney, G.G.; Richardson, T.D.	Sustainability	2018	10.3390/su10041165	3	Here, we studied communities within the Wet Tropics bioregion, Australia to explore whether people's perceived preparedness for a future cyclone relates to their: (1) perceived individual adaptive capacity (in terms of flexibility and capacity to plan and learn); and (2) structural and cognitive social capital.
1	Implications of Regulatory Drought for farmer Use of Climate Information in the Klamath Basin	VanderMolen, K.; Horangic, A.	Weather Climate and Society	2018	10.1175/WCAS-D-17-0078.1	3	This study asks whether farmer use of climate information increases under the occurrence of more extreme climatic events for which those repertoires lack referent-in this case, severe hydrological and related regulatory drought in the Klamath basin. Informants (with numbers of each in parentheses) included an extension officer (1), representatives of local irrigation districts and agricultural organizations (2), relevant federal and state agency representatives (3), an agricultural consultant (1), and farmers (6) identified through a scoping interview with the former.
1	Farmers' perceptions of risk sources and risk coping strategies in Pakistan	Nazir, A.; Li, G.; Sheikh, M.J.; Zhou, X.; Humayoon, A.; Rizwan, M.; Akhtar, S.	Journal of Animal and Plant Sciences	2018		4	Agricultural risks potentially decelerate the growth of a country and augment poverty level. For understanding farmers' risk behavior and strategies to cope up possible related risks, the association to socioeconomic attributes, perceived risk sources and coping strategies were studied.
1	Does it matter if people think climate change is human caused?	Hartter, J.; Hamilton, L.C.; Boag, A.E.; Stevens, F.R.; Ducey, M.J.; Christoffersen, N.D.; Oester, P.T.; Palace, M.W.	Climate Services	2018	10.1016/j.cliser.2017.06.014	3	Two recent telephone surveys found that 37% (in 2011) and 46% (in 2014) of eastern Oregon (USA) respondents accept the scientific consensus that human activities are now changing the climate.
1	Consumers' preferences for carbon labels and the underlying reasoning. A mixed methods approach in 6 European countries	Feucht, Y.; Zander, K.	Journal of Cleaner Production	2018	10.1016/j.jclepro.2017.12.236	4	The present research explores whether carbon labels are an appropriate and effective tool for increasing climate-friendly food consumption in Europe.
7	How are perceptions associated with water consumption in Canadian Inuit? A cross-sectional survey in Rigolet, Labrador	Wright, C.J.; Sargeant, J.M.; Edge, V.L.; Ford, J.D.; Farahbakhsh, K.; Shiwak, I.; Flowers, C.; Gordon, A.C.; Harper, S.L.	Science of the Total Environment	2018	10.1016/j.scitotenv.2017.10.255	4	The objectives of this research were to describe perceptions of municipal tap water, examine use of water sources and changes following the installation of a potable water dispensing unit (PWDU) in 2014, and identify factors associated with water consumption in the Inuit community of Rigolet.
1	Extent of disaster courses delivery for the risk reduction in Rwanda	Nahayo, L.; Li, L.H.; Habiyaremye, G.; Richard, M.; Mukanyandwi, V.; Hakorimana, E.; Mupenzi, C.	International Journal of Disaster Risk Reduction	2018	10.1016/j.ijdrr.2017.09.046	3	This study assessed the extent to which disaster related courses are integrated into formal education to enhance community's awareness and resilience to disasters in Kigali City, Rwanda. A face-to-face interview was conducted across 56 respondents purposively sampled from the primary and secondary schools, Universities, Ministry of disaster Management and Refugees and Rwanda Education Board in 2016.
1	Salinity tolerance of non-native suckermouth armoured catfish (Loricariidae: Pterygoplichthys sp.) from Kerala, India	Kumar, A.B.; Schofield, P.J.; Raj, S.; Satheesh, S.	Management of Biological Invasions	2018	10.3391/mbi.2018.9.1.05	4	They are freshwater fishes, but may also use low-salinity habitats such as estuaries for feeding or dispersal. Here we report results of a field survey and salinity-tolerance experiments for a population of Pterygoplichthys sp. collected in Kerala, India.
1	Farmers' Willingness to Pay for Climate Information Services: Evidence from Cowpea and Sesame Producers in Northern Burkina Faso	Ouedraogo, M.; Barry, S.; Zougmore, R.B.; Partey, S.T.; Some, L.; Baki, G.	Sustainability	2018	10.3390/su10030611	4	This paper estimates farmers' willingness to pay (WTP) for climate information within cowpea and sesame value chains in Northern Burkina Faso.
1	Identifying and quantifying landowner perspectives on integrated flood risk management	Milman, A.; Warner, B.P.; Chapman, D.A.; Gianotti, A.G.S.	Journal of Flood Risk Management	2018	10.1111/jfr3.12291	3	To illuminate landowner perspectives on flood mitigation and the drivers of those perspectives, we surveyed landowners in the Deerfield River Watershed, Massachusetts (USA).
1	Vulnerability and Adaptation of Livestock Producers to Climate Variability and Change	Karimi, V.; Karami, E.; Keshavarz, M.	Rangeland Ecology & Management	2018	10.1016/j.rama.2017.09.006	4	This study identified the main adaptation strategies employed by the herders of this region (i.e., purchasing fodder; rotational grazing; raising a mixed-herd, on-farm occupation; and postharvest grazing).
1	Evaluation of Pakistani farmers' willingness to pay for crop insurance using contingent valuation method: The case of Khyber Pakhtunkhwa province	Fahad, S.; Jing, W.	Land Use Policy	2018	10.1016/j.landusepol.2017.12.024	4	This study aims to examine the willingness of Pakistani farmers to pay for insurance premiums by conducting a household survey.

1	Iqaluktutiaq Voices: Local Perspectives about the Importance of Muskoxen, Contemporary and Traditional Use and Practices	Tomaselli, M.; Gerlach, S.C.; Kutz, S.J.; Checkley, S.L.; Cote, M.; Emingak, P.; Evalik, C.; Anablak, S.; Ogina, J.; Peterson, F.; Evalik, J.; Buchan, M.; Haniliak, J.; Panioyak, J.; Greenley, B; Sitatak, B.; Maghagak, A.; Maksagak, B.; McLennan, D.; Kakolak, E.; Ohokanoak, H.	Artic	2018	10.14430/arctic4697	4	With the goal of informing a community-based participatory muskox health surveillance system in the community of Iqaluktutiaq (Cambridge Bay) on Victoria Island, Nunavut, Canada, we explored the importance of muskoxen for community residents, their relevance for local food security, and the relationships and interactions between Iqaluktutiamiut and muskoxen. We investigated these themes through individual interviews of 30 community members identified as muskox experts by local organizations.
1	The Hydro-economics of Mining	Ossa-Moreno, J.; McIntyra, N.; Ali, S.; Smarts, J.C.R.; Rivera, D.; Lall, U.; Keir, G.	Ecological Economics	2018	10.1016/j.ecolecon.2017.11.010	4	The paper focuses on identifying and describing features of large-scale mines and mine regions that are challenging to analyse such as: magnitude of capital involved, time-scale and remoteness of projects, inherent environmental risks, and strong negative perceptions about mining's impacts on water.
1	Soil and ecosystem services: Current knowledge and evidences from Italian case studies	Andrea, F.; Bini, C.; Amaducci, S.	Applied Soil Ecology	2018	10.1016/j.apsoil.2017.06.031	4	In this study, the lessons learned from Italian case studies on the usefulness of using a soil health assessment framework based on multiple soil ES are presented.
1	Visitor Preferences for Visual Changes in Bark Beetle-Impacted Forest Recreation Settings in the United States and Germany	Arnberger, A.; Ebenberger, M.; Schneider, I.E.; Cottrell, S.; Schlueter, A.C.; von Ruschkowski, E.; Venette, R.C.; Snyder, S.A.; Gobster, P.H.	Environmental Management	2018	10.1007/s00267-017-0975-4	4	This study explored forest visitor preferences with a discrete choice experiment that photographically simulated conifer forest stands with varying levels of bark beetle outbreaks, forest and visitor management practices, and visitor use levels and compositions.
1	Assessment of agricultural groundwater users in Iran: a cultural environmental bias	Salehi, S.; Chizari, M.; Sadighi, H.; Bijani, M.	Hydrogeology Journal	2018	10.1007/s10040-017-1634-9	4	This study aimed to explore the causal effect of cultural environmental bias on 'sustainable behavior' among agricultural groundwater users in Fars province, Iran, according to Klockner's comprehensive model.
1	Measuring public perception and preferences for ecosystem services: A case study of bee pollination in the UK	Mwebaze, P.; Marris, G.C.; Brown, M.; MacLeod, A.; Jones, G.; Budge, G.E.	Land Use Policy	2018	10.1016/j.landusepol.2017.11.045	4	Using the contingent valuation (CV) method, this paper evaluates how much public support there would be in preventing further decline to maintain the current number of bees by estimating the willingness to pay (WTP) for a theoretical bee protection policy in the UK.
1	Chinese traditional perceptions of the calendar year: Implications of Jieqi for contemporary product development and sustainability	Yang, X.Y.	Tourism Management	2018	10.1016/j.tourman.2017.08.013	4	This paper explores the implications for climate tourism development that follows the 2016 decision by UNESCO to add a traditional cultural understanding of the annual seasonal changes in Chinese "intangible culture."
1	Inherent vulnerability assessment of rural households based on socio-economic indicators using categorical principal component analysis: A case study of Kimsar region, Uttarakhand	Rajesh, S.; Jain, S.; Sharma, P.	Ecological Indicators	2018	10.1016/j.ecolind.2017.10.014	4	Contributing towards this growing trend of social vulnerability assessment, this study proposes a framework to measure inherent vulnerability, which is centered on hazard generic and livelihood oriented socioeconomic factors of vulnerability. Inherent vulnerability is defined as the predisposition of a household to suffer harm.
1	Insects as a piece of the puzzle to mitigate global problems: an opportunity for ecologists	Prather, C.M.; Laws, A.N.	Basic and Applied Ecology	2018	10.1016/j.baae.2017.09.009	4	We give several examples where insects are currently being used, or are being considered for future use, as a part of the solution to a global problem, including their potential roles as a part of the solution to sustainable fuel and food systems, deforestation and other environmental degradation, and global inequities. E
1	Understanding social-ecological interdependence using ecosystem services perspective in Bhutan, Eastern Himalayas	Kandel, P.; Tshering, D.; Uddin, K.; Lhamtshok, T.; Aryal, K.; Karki, S.; Sharma, B.; Chettri, N.	Ecosphere	2018	10.1002/ecs2.2121	4	Biophysical and economic values are often used to aid understanding of the complex interplay between ecosystems, their services, and human well-being, but community values are rarely considered. In a case study of Barshong gewog in Bhutan, we used mapping methods that involved (1) local knowledge and perceptions collected using participatory rural appraisal tools, (2) a household survey, and (3) geospatial inputs, to understand the linkages between human well-being and ecosystem services at the local level, as perceived by the community. The study identified three major ecosystems-forest, agriculture, and freshwater-that contribute highly to local livelihoods.
1	Building farm-level capacities in irrigation water management to adapt to climate change	Kakumanu, K.R.; Kaluvai, Y.R.; Nagothu, U.S.; Lati, N.R.; Kotapati, G.R.; Karanam, S.	Irrigation and Drainage	2018	10.1002/ird.2143	4	The climate change and adaptation (ClimaAdapt) programme was implemented from 2012 to 2016 to build farm-level capacities and enhance the adaptive capacity of the agricultural and water sectors in the Krishna basin of Andhra Pradesh and Telangana states. Water-saving interventions such as direct seeded rice, a modified system of rice intensification and alternate wetting and drying (AWD) of rice were implemented in a cluster approach and enhanced water productivity. Water measurements were carried out by using flumes and ultrasonic sensors.
1	Field characteristics driving farm-scale decision-making on land allocation to primary crops in high latitude conditions	Peltonen-Sainio, P.; Jauhiainen, L.; Sorvali, J.; Laurila, H.; Rajala, A.	Land Use Policy	2018	10.1016/j.landusepol.2017.11.040	4	To govern better future landscape planning of high-latitude agricultural systerris, it is necessary to understand fully the drivers that currently determine farmers' land allocation to different crops. The aim of this study was to identify key farm and field characteristics that drive farmers' land allocation, based on substantial datasets, and to benchmark findings for farmer perceptions with interviews.
1	Agricultural advisory and financial services; farm level access, outreach and impact in a mixed cropping district of Punjab, Pakistan	Elahi, E.; Abid, M.; Zhang, L.Q.; ul Haq, S.; Sahito, J.G.M.	Land Use Policy	2018	10.1016/j.landusepol.2017.12.006	4	Using a dataset of 240 farmers collected through face-to-face interviews in 48 villages of district Sargodha in Punjab, Pakistan, this study analyzes farmers' access to and use of farm advisory and financial services, its impact on wheat productivity and barriers to their access.
1	Urban climate change, livelihood vulnerability and narratives of generational responsibility in Jinja, Uganda	McQuaid, K.; Vanderbeck, R.M.; Valentine, G.; Liu, C.; Chen, L.; Zhang, M.; Diprose, K.	Africa	2018	10.1017/S0001972017000547	6	There is an urgent need to understand lived experiences of climate change in the context of African cities, where even small climate shocks can have significant implications for the livelihoods of the urban poor. This article examines narratives of climate and livelihood changes within Jinja Municipality, Uganda, emphasizing how Jinja's residents make sense of climate change through their own narrative frames rather than through the lens of global climate change discourses.
1	Consumers' climate-impact estimations of different food products	Shi, J.; Visschers, V.H.M.; Bumann, N.; Siegrist, M.	Journal of Cleaner Production	2018	10.1016/j.jclepro.2016.11.140	4	We conducted five online experiments to better understand how laypersons assess the climate impact of various foods.
1	Confronting Climate Change Challenges to Dryland Cereal Production: A Call for Collaborative, Transdisciplinary Research, and Producer Engagement	Eigenbrode, S.D.; Binns, W.P.; Huggins, D.R.	Frontiers in Ecology and Evolution	2018	10.3389/fevo.2017.00164	4	Conference goals were to: (1) strengthen the global network of researchers addressing climate change effects on semi-arid cereal-based systems, (2) share the approaches to achieving transdisciplinary collaboration to advance climate change resilience in cereal systems, and (3) identify the elements of a collaborative research agenda that are needed to advance global food security in the twenty-first century. This paper distills the conference themes and summarizes the calls to action that were discussed: Establish coordinated, large scale, transdisciplinary efforts; Consider Genetic x Environment x Management x Social system (G x E x M x S) interactions; Integrate social, economic, and biophysical science, and engineering; Improve integration among knowledge communities;
1	Mobile Extension in Enhancing the Livelihood of Farmers in India	Murugan, G.S.; Aram, I.A.; Raj, S.A.; Nambi, A.A.; Anabel, N.J.	International Journal of E-Politics	2018	10.4018/IJEP.2018010104	4	This research article investigates the effectiveness of the agricultural extension tool of mobile phone among farmers in areas of rural in Puducherry, during the years 2010-2013.
1	Environmental cognitions mediate the causal explanation of land change	Yu, Q.Y.; Verburg, P.H.; Wu, W.B.	Journal of Land Use Science	2018	10.1080/1747423X.2019.1567837	4	This paper compares three existing conceptual frameworks, in terms of underlying driving forces and proximate causes, actors, and environmental cognitions, by aligning the relevant elements into a causal chain.

1	Climate change beliefs and forest management in eastern Oregon: implications for individual adaptive capacity	Boag, A.E.; Hartter, J.; Hamilton, L.C.; Christoffersen, N.D.; Stevens, F.R.; Palace, M.W.; Ducey, M.J.	Ecology and Society	2018	10.5751/ES-10355-230401	3	In this case study we assessed barriers to both intentional and incidental climate-adaptive forest management among nonindustrial private forest owners in eastern Oregon, USA
1	Can Farmer Adapt to Climate Change - An Evidence from Shandong in China	Cao, G.P.; Wang, C.J.; Zhu, L.G.; Fei, X.M.	Ekoloji	2018		3	Does not mention smallholders. Given the field survey data about 524 peasant households in 64 villages of 32 counties in Shandong Province, this article applies Ricardian Model to make an empirical analysis of influences of climate change on peasant households.
1	Study on farmers land consolidation adaptation intention: A structural equation modeling approach, the case of Sichuan province, China	Gessesse, A.T.; Li, H.J.; He, G.; Berhe, A.A.	China Agricultural Economic Review	2018	10.1108/CAER-09-2016-0142	4	The purpose of this paper is to examine the effects of media and social network in the development of farmers land consolidation (LC) awareness, perception and adaptation intention decisions.
1	Factors influencing the adoption of improved cultivars: a case of peach farmers in Pakistan	Ullah, A.; Khan, D.; Zheng, S.F.; Ali, U.	Ciencia Rural	2018	10.1590/0103-8478cr20180342	4	This study aimed to investigate factors influencing the adoption of improved cultivars (ICs) in peach production in Khyber Pakhtunkhwa province of Pakistan.
6	Contextual analysis of dynamic drought perception among small farmers in Jamaica	Gamble, D.W.; Burrell, D.; Popke, J.; Curtis, S.	Climate Research	2018	10.3354/cr01490	3	Este artigo tem duplicado em 2017 (Scopus).The purpose of this research is to identify the environmental variables, seasonal patterns, and geographical characteristics that correlate with the positive identification of drought by farmers in St. Elizabeth, Jamaica.
1	Mobile-based climate services impact on farmers risk management ability in India	Mittal, S.; Hariharan, V.K.	Climate Risk Management	2018	10.1016/j.crm.2018.08.003	4	In this context, this paper analyzes the listening rate of the messages by the individual farmers over the span of two years. The paper also analyzes and describes the process of change of farmers' ability to use the information in the messages to improve the awareness and then further convert the information into economic gains
1	Effects of wildlife crop raiding on the livelihoods of arable farmers in Khumaga, Boteti sub-district, Botswana	Gontse, K.; Mbaiwa, J.E.; Thakadu, O.T.	Development Southern Africa	2018	10.1080/0376835X.2018.1495061	4	This paper, therefore, assesses the economic effects of wildlife crop raiding on the livelihoods of arable farmers in Khumaga, Boteti sub-district, Botswana.
1	Hydrological Response and Complex Impact Pathways of the 2015/2016 El Nino in Eastern and Southern Africa	Siderius, C.; Gannon, K.E.; Ndiyoi, M.; Opere, A.; Batisani, N.; Olago, D.; Pardoe, J.; Conway, D.	Earths Future	2018	10.1002/2017EF000680	4	We examine the hydrological response and impact pathways of the 2015/2016 El Nino in eastern and southern Africa, focusing on Botswana, Kenya, and Zambia.
1	Adaptation pathways to cope with salinization in south-west coastal region of Bangladesh	Hossain, P.R.; Ludwig, F.; Leemans, R.	Ecology and Society	2018	10.5751/ES-10215-230327	4	This study analyzes the causes of salinity increase, their cascading impacts on different coastal systems, and their livelihood implications, and assesses potential coping measures through innovative adaptation pathways for the most affected coastal systems.
1	Public estimates of support for offshore wind energy: False consensus, pluralistic ignorance, and partisan effects	Sokoloski, R.; Markowitz, E.M.; Bidwell, D.	Energy Policy	2018	10.1016/j.enpol.2017.10.005	4	The current research brings a new perspective to the literature by showing that how members of the public perceive support among others relates to their own opinions of offshore wind energy.
1	Framing climate change communication to prompt individual and collective action among adolescents from agricultural communities	Stevenson, K.T.; King, T.L.; Selm, K.R.; Peterson, M.N.; Monroe, M.C.	Environmental Education Research	2018	10.1080/13504622.2017.1318114	3	Among 950 high school agriculture students in North Carolina, we found agriculture and environment framing of climate change, but not community and health frames, elicited feelings of worry, and these together with community frames elicited hope.
1	Survey of Beaver-related Restoration Practices in Rangeland Streams of the Western USA	Pilliod, D.S.; Rohde, A.T.; Charnley, S.; Davee, R.R.; Dunham, J.B.; Gosnell, H.; Grant, G.E.; Hausner, M.B.; Huntington, J.L.; Nash, C.	Environmental Management	2018	10.1007/s00267-017-0957-6	4	Hence, we identified a need to assess the use of beaver-related restoration projects in western rangelands to increase awareness and accountability, and identify gaps in scientific knowledge. We inventoried 97 projects implemented by 32 organizations, most in the last 10 years. We found that beaver-related stream restoration projects undertaken mostly involved the relocation of nuisance beavers.
1	Bark beetles as agents of change in social-ecological systems	Morris, J.L.; Cottrell, S.; Fettig, C.J.; DeRose, R.J.; Mattor, K.M.; Carter, V.A.; Clear, J.; Clement, J.; Hansen, W.D.; Hicke, J.A.; Higuera, P.E.; Seddon, A.W.R.; Seppa, H.; Sherriff, R.L.; Stednick, J.D.; Seybold, S.J.	Frontiers in Ecology and the Environment	2018	10.1002/fee.1754	4	We synthesize experiences from recent outbreaks to encourage knowledge transfer from previously impacted communities to potentially vulnerable locations that may be at risk from future bark beetle epidemics.
1	Using simulations to forecast homeowner response to sea level rise in South Florida: Will they stay or will they go?	Treuer, G.; Broad, K.; Meyer, R.	Global Environmental Change-Human and Policy Dimensions	2018	10.1016/j.gloenvcha.2017.10.008	4	In this research we explore this issue by focusing on the case of South Florida, which is one of the most financially vulnerable regions in the world. We report the results of a novel online simulation that accelerates 348 South Florida homeowners thirty-five years into the future so that they can 'live' the effects of sea level rise.
1	A framework for engaging stakeholders on the management of alien species	Novoa, A; Shackleton, R; Canavan, S; Cybele, C; Davies, SJ; Dehnen-Schmutz, K; Fried, J; Gaertner, M; Geerts, S; Griffiths, CL; Kaplan, H; Kumschick, S; Le Maitre, DC; Measey, GJ; Nunes, AL; Richardson, DM; Robinson, TB; Touza, J; Wilson, JRU	Journal of Environmental Management	2018	10.1016/j.jenvman.2017.09.059	4	There is, therefore, increasing interest in engaging stakeholders affected by alien species or by their management. Through a facilitated workshop and consultation process including academics and managers working on a variety of organisms and in different areas (urban and rural) and ecosystems (terrestrial and aquatic), we developed a framework for engaging stakeholders in the management of alien species.
1	Economic issues to consider for gene drives	Mitchell, P.D.; Brown, Z.; McRoberts, N.	Journal of Responsible Innovation	2018	10.1080/23299460.2017.1407914	4	We examine four economic issues regarding gene drive applications made possible by gene editing technologies.
1	Plant molecular responses to the elevated ambient temperatures expected under global climate change	Fei, Q.H.; Li, J.J.; Luo, Y.H.; Ma, K.; Niu, B.T.; Mu, C.J.; Gao, H.H.; Li, X.F.	Plant Signaling & Behavior	2018	10.1080/15592324.2017.1414123	4	However, few studies have focused on the molecular mechanisms behind plant responses to mild increases in ambient temperature. Previous research has found that moderately higher ambient temperatures can induce hypocotyl elongation and early flowering. Recent evidence demonstrates roles for the phytohormones auxin and ethylene in adaptive growth of plant roots to slightly higher ambient temperatures.
1	Climate Change and Ideological Transformation in United States Agriculture	Stuart, D.	Sociologia Ruralis	2018	10.1111/soru.12175	3	Data from 154 personal interviews with corn farmers in the Midwestern United States reveals that many farmers believe that humans play some role in climate change and that climate change has serious and negative impacts on agriculture.
1	Effects of the safari hunting tourism ban on rural livelihoods and wildlife conservation in Northern Botswana	Mbaiwa, J.E.	South African Geographical Journal	2018	10.1080/03736245.2017.1299639	4	This paper examines the effects of the safari hunting ban of 2014 on rural livelihoods and wildlife conservation in Northern Botswana using the social exchange theory.

1	Micro-level assessment of regional and local disaster impacts in tourist destinations	Schmude, J.; Zavareh, S.; Schwaiger, K.M.; Karl, M.	Tourism Geographies	2018	10.1080/14616688.2018.1438506	4	We address the challenges of recovery using the tourism disaster management framework by Faulkner. To calculate precise damage assessments, we develop a micro-level assessment model to analyze and understand disaster impacts at the micro-level supporting tourism recovery in an affected destination. We examine economic consequences of a disaster at a small regional scale arguing recovery from a natural disaster is more difficult in individual areas because of differences in geographic location or infrastructure development.
1	Public land managers and sustainable urban vegetation: The case of low-input turfgrasses	Barnes, M.R.; Nelson, K.C.; Meyer, A.J.; Watkins, E.; Bonos, S.A.; Horgan, B.P.; Meyer, W.A.; Murphy, J.; Yue, C.Y.	Urban Forestry & Urban Greening	2018	10.1016/j.ufug.2017.12.008	3	We surveyed U.S. public land managers in Minnesota and New Jersey metropolitan areas about their preferences and beliefs regarding low-input turfgrass, specifically cool season fine fescue, and related those beliefs to opportunities for urban environmental sustainability.
1	Growing at the Margins: Adaptation to Severe Weather in the Marginal Lands of the British Isles	Speakman, D.	Weather Climate and Society	2018	10.1175/WCAS-D-16-0113.1	4	Through detailed interviews, a range of adaptations to specific weather hazards, and their impacts, has been recorded.
1	Climate change: a challenge to sustainable land resource management in agriculture and the extrension of arable crops mechanization in Nigeria	Simeon, P.O.; Jijingi, H.E.; Apaji, N.J.	Scientific Papers-Series Management Economic Engineering in Agriculture and Rural	2018		4	This paper is an original scholarly inquiry based on review of related literatures (academic and public awareness information outlets), reports and physical observations of the authors. The results reveal that a worrisome land management culture and practices at present in Nigeria.
1	Improvisatory Activist Scholarship: Dance Practice as Metaphor for Participatory Action Research	Roge, P.	Acme-An International E-Journal for Critical Geographies	2018		4	I define improvisatory activist scholarship as attempts to disrupt commonly-held meanings in research through the skilled negotiation of unexpected circumstances and through attention to the circulation of power among collaborators.
1	Future expectations of forest soils: increasing productivity within environmental limits using new knowledge	Clinton, PW	NEW ZEALAND JOURNAL OF AGRICULTURAL RESEARCH	2018	10.1080/00288233.2018.1446992	4	This paper explores current research that is seeking new knowledge on tree responses to biostimulants, balanced nutrition additions, soil-microbe-plant relationships and our ability to influence the outcomes of these interactions in ways that benefit forest productivity and resilience all with a focus on producing more for less, within environmental limits and without compromising wood properties.
1	Assessing adaptive capacity and adaptation: insights from Samoan tourism operators	Parsons, M.; Brown, C.; Nalau, J.; Fisher, K.	Climate and Development	2018	10.1080/17565529.2017.1410082	4	This research uses a case study of Samoa, a Pacific island nation, that is highly dependent on beach tourism and already vulnerable to a variety of natural hazards. The research examines the adaptive capacity of tourism operators in Samoa and the ways in which Faasamoa (the Samoan way of life) is a fundamental part of how tourism operators plan for and respond to climate variability and extremes.
1	Drama in higher education for sustainability: work-based learning through fiction?	Osterlind, E.	Higher Education Skills and Work-Based Learning	2018	10.1108/HESWBL-03-2018-0034	3	The purpose of this paper is to highlight the use of drama in the context of professional learning for sustainability, and specifically, a drama workshop on sustainability for in-service teachers.
1	Studying young people' views on deployment of renewable energy sources in Iran through the lenses of Social Cognitive Theory	Komendantova, N.; Yazdanpanah, M.; Shafiei, R.	Aims Energy	2018	10.3934/energy.2018.2.216	4	Based on socio cognitive theory this paper examines the patters of behavior of young adults in relation to energy use.
1	Analysis of Climate-Related Risk and Maize Production in Southwest, Nigeria	Oparinde, L.O.; Okogbue, E.C.	Scientific Papers-Series Management Economic Engineering in Agriculture and Rural	2018		4	Therefore, it is imperative to analyse the climate-related risk and maize production in Southwest, Nigeria. Secondary data between 1981 and 2012 were collected on relevant variables and analysed using Growth Function, Co-integration Model (Autoregressive Distributed Lag Approach) and J-P Model.
1	Farmers' Perception on the Sustainability of as a Climate Change Adaptation Strategy in Agusan Agusan Del Sur and North Cotobato, Philippines	Furoc-Paelmo, R; Cosico, RSA; Cabahug, RED; Castillo, AKA; Castillo, ASA; Visco, RG	Journal of Environmental Science and Management	2018		3	This documentation research sought to evaluate the effectiveness of rubber-based agroforestry typologies as a climate change adaptation strategy in the major rubber producing regions in the Philippines, particularly in Agusan del Sur and North Cotabato.
1	Sonifying social-ecological change: A wetland laments agricultural transformation	Angeler, DG; Alvarez-Cobelas, M; Sanchez-Carrillo, S	Ecology and Society	2018	10.5751/ES-10055-230220	4	We use data sonification, an approach that allows converting scientific data into music, to document the large-scale transformation of the agricultural sector in central Spain during the 1970s.
1	Quantifying the role of traditional rice terraces in regulating water resources: implications for management and conservation efforts	Soriano, MA; Herath, S	AGROECOLOGY AND SUSTAINABLE FOOD SYSTEMS	2018	10.1080/21683565.2018.1437497	4	This article focuses on the Ifugao Rice Terraces (IRT) of the Philippines, a sustainable agroecosystem built on the harmonious relationship between indigenous people and their local environment. We elucidate how the rice terraces influence the hydrologic response at a small catchment scale through detailed field monitoring and physically based mathematical modeling.
1	3D Perception-Based Collision-Free Robotic Leaf Probing for Automated Indoor Plant Phenotyping	Bao, Y.; Shah, D.; Tang, L.	Transactions of the Asabe	2018	10.13031/trans.12653	4	In this work, a Kinect V2 sensor, a high-precision 2D laser profilometer, and a six-axis robotic manipulator were used to automate the leafprobing task.
1	Climate Change Causing Food Insecurity in East Africa: Traditional and non-traditional Strategies to Solve the Problem	Natamba, L.; Zhang, W.; Zhang, J.; Zhao, X.	Applied Ecology and Environmental Research	2018	10.15666/aeer/1603_22332254	4	Literature searches have been used to gather information about what has been done and what should be done to safeguard communities from food insecurity caused by climate shocks.
1	A nexus between air pollution, energy consumption and growth of economy: A comparative study between the USA and China-based on the ARDL bound testing approach	Koondhar, M.A.; Qiu, L.L.; Li, H.J.; Liu, W.W.; He, G.	Agricultural Economics-Zemedelska Ekonomika	2018	10.17221/101/2017-AGRICECON	4	The aim of the study is to investigate and compare the correlation between energy consumption, air pollution and economic growth in China and the USA.

1	Mainstreaming risk reduction into self-build housing: the negligible role of perceptions	Sou, G.	Climate and Development	2018	10.1080/17565529.2017.1318746	6	This article unpacks the relationship between risk perceptions and responses in cities of the global south.
1	Climate change in Colombia: A study to evaluate trends and perspectives for achieving sustainable development from society	Martinez, C.I.P.; Alfonso, W.H.	International Journal of Climate Change Strategies and Management	2018	10.1108/IJCCSM-04-2017-0087	3	This research analyses and evaluates the trends and perspectives of climate change in Colombia. This study aims to understand the main ideas and concepts of climate change in five regions of the country by analysing attitudes and values, information habits, institutionalism and the social appropriation of science and technology.
1	Households' demand for groundwater conservation: the case of irrigation practices in Kombolcha District, Eastern Ethiopia	Fentaw, S.; Mezgebo, A.	Ekonomika Polioprivreda-Economics of Agriculture	2018	10.5937/ekoPolj1801173F	4	Therefore, in this study a contingent valuation survey was conducted in Kombolcha district to elicit households' willingness to pay for groundwater conservation.
1	Place attachment, recreational activities, and travel intent under changing climate conditions	Wilkins, E.J.; de Urioste-Stone, S.	Journal of Sustainable Tourism	2018	10.1080/09669582.2017.1417416	4	This study looks at how visitors' attachment to Mount Desert Island (MDI), Maine, affects their intended future visitation under changing climate conditions.
1	The Influence of an Extreme Warm Spell on Public Support for Government Involvement in Climate Change Adaptation	Lee, G.E.; Loveridge, S.; Winkler, J.A.	Annals of the American Association of Geographers	2018		3	This study uses an extreme warm spell that occurred during a survey of Michigan residents to evaluate the influence of complex temperature effects on public support for government involvement in the agricultural sector's adaptation to climate change.
1	Public perception of the relationship between climate change and unconventional gas development (fracking') in the US	Evensen, D.; Brown-Steiner, B.	Climate Policy	2018	10.1080/14693062.2017.1389686	3	This article presents two surveys, one of a representative national (US) sample and one of a representative sample of residents in the Marcellus Shale region of Pennsylvania and New York. It examines whether respondents associated UGD with climate change, and the relationship between this association and their support for, or opposition to, UGD.
1	Enhancing adaptation to climate variability in the East African highlands: a case for fostering collective action among smallholder farmers in Kenya and Uganda	Ombogoh, D.B.; Tanui, J.; McMullin, S.; Muriuki, J.; Mowo, J.	Climate and Development	2018	10.1080/17565529.2016.1174665	4	This paper provides evidence of collective action in enhancing local adaptation to climate variability. It determines the importance of different forms of collective action for enhancing adaptation.
1	Determinants of livelihood vulnerability in farming communities in two sites in the Asian Highlands	Sujakhu, N.M.; Ranjitkar, S.; Niraula, R.R.; Salim, M.A.; Nizami, A.; Schmidt-Vogt, D.; Xu, J.C.	Water International	2018	10.1080/02508060.2017.1416445	4	Livelihood vulnerability was assessed, classified to four categories and regressed against current adaptive capacity using logistic regression.
1	Managing the risks from the water-related impacts of extreme weather and uncertain climate change on inland aquaculture in Northern Thailand	Lebel, L.; Lebel, P.; Chitmanat, C.; Uppanunchai, A.; Apirumanekul, C.	Water International	2018	10.1080/02508060.2017.1416446	4	This article assesses the robustness of a set of potential adaptation strategies for Northern Thailand using a rule-based assessment model to synthesize information from secondary sources, fish farmers, officials and experts.
1	Weather sensitivity and climate change perceptions of tourists: a segmentation analysis	Wilkins, E.; de Urioste-Stone, S.; Weiskittel, A.; Gabe, T.	Tourism Geographies	2018	10.1080/14616688.2017.1399437	3	Therefore, the purpose of this investigation is to better understand potentially varying perceptions and behavior of different tourist types, specifically in regards to their weather sensitivity, climate change concern, and behavioral intention for climate change mitigation.
1	Mainstreaming climate change adaptation into inland aquaculture policies in Thailand	Uppanunchai, A.; Chitmanat, C.; Lebel, L.	Climate Policy	2018	10.1080/14693062.2016.1242055	4	This study explores the climate-related content, climate sensitivities, and opportunities to incorporate climate change concerns in a set of aquaculture policies by the government of Thailand.
1	Diversity, distribution pattern, endemism and indigenous uses of wild edible plants in Cold Desert Biosphere Reserve of Indian Trans Himalaya	Sharma, L.; Samant, S.S.; Kumar, A.; Lal, M.; Devi, K.; Tewari, L.M.	Indian Journal of Traditional Knowledge	2018		4	Therefore, the present study has been conducted in Cold Desert Biosphere Reserve (CDBR) of Trans Himalaya to; (i) assess the diversity and distribution pattern of wild edible plants; (ii) analyze for nativity and endemism; (iii) assess the indigenous uses and traditional practices; (iv) document the nutritional content of selected wild edible plants; and (v) suggest suitable management options.
1	Development of groundwater favourability map using GIS-based driven data mining models: an approach for effective groundwater resource management	Mogaji, K.A.; Lim, H.S.	Geocarto International	2018	10.1080/10106049.2016.1273400	4	The generated thematic maps of the seven hydrogeological parameters of the DRASTIC model were considered as pollution potential conditioning factors and were analysed with the developed ordered weighted average-DRASTIC index model algorithms to construct the GVPI map.
1	How do African Farm Households Respond to Changes in Current and Past Weather Patterns? A Sctructural Panel Data Analysis from Malawi	Sesmero, J.; Ricker-Gilbert, J.; Cook, A.	American Journal of Agricultural Economics	2018	10.1093/ajae/aax068	4	This finding suggests that developing more weather-resilient maize varieties and promoting smallholder livelihood diversification strategies may help mitigate the effects of adverse weather on the most vulnerable households.
1	Repeasantisation in The United States	Nelson, J.; Stock, P.	Sociologia Ruralis	2018	10.1111/soru.12132	3	This article adopts Van der Ploeg's theory of repeasantisation to demonstrate that, even in the largely industrialised agricultural state of Kansas, USA, there are unexpected interstices within neoliberalised agriculture where industrial farmers can exercise and produce autonomy.
1	Climate change effects on wildland fire risk in the Northeastern and Great Lakes states predicted by a downscaled multi-model ensemble	Kerr, G.H.; DeGaetano, A.T.; Stoof, C.R.; Ward, D.	Theoretical and Applied Climatology	2018	10.1007/s00704-016-1994-4	3	This study is among the first to investigate wildland fire risk in the Northeastern and the Great Lakes states under a changing climate.
1	Flood concerns and impacts on rural landowners: An empirical study of the Deerfield watershed, MA (USA)	Gianotti, AGS; Warner, B; Milman, A	Environmental Science & Policy	2018	10.1016/j.envsci.2017.10.007	3	To address this gap, we investigate the impacts of flooding on rural landowners in Massachusetts, USA, the actions they have taken to protect their property, and the ways these concerns and actions vary by land use.
12	An Assessment of Climate Change and Health Vulnerability and Adaptation in Dominica	Schnitter, R., Verret, M., Berry, P., Chung Tiam Fook, T., Hales, S., Lal, A., Edwards, S.	Int J Environ Res Public Health	2018	10.3390/ijerph16010070	4	A climate change and health vulnerability and adaptation assessment was conducted in Dominica, a Caribbean small island developing state located in the Lesser Antilles.
6	Framing Climate Change Adaptation from a Pacific Island Perspective - The Anthropology of Emerging Legal Orders	Klepp, S.	Sociologus	2018	10.3790/soc.68.2.149	4	The article analyses how the government brings together climate change discourses with its struggle for new rights and resources for the country.
11	From sea-level rise to seabed grabbing: The political economy of climate change in Kiribati	Mallin, M.A.F.	Marine Policy	2018	10.1016/j.marpol.2018.04.021	4	This paper presents a critical political economy perspective on recent and ongoing developments in the Pacific atoll country of Kiribati, where the issue of rising sea levels has become an incrementally politicised concern.

7	Small island perspectives on climate change	Walshe, R.A.; Stancioff, C.E.	Island Studies Journal	2018	10.24043/isj.56	8	This special thematic section presents eight papers that highlight local responses and localized impacts of climate change on islands, reiterating the importance of considering local community perspectives in small island contexts to overcome simplistic viewpoints.
1	Islandness within climate change narratives of small island developing states (SIDS)	Kelman, I.	Island Studies Journal	2018	10.24043/isj.52	4	Small island developing states (SIDS) are portrayed as icons of climate change impacts, with assumed islandness characteristics being used to emphasise vulnerability. Meanwhile, island resilience expressed as the stability of island "paradises" is said to be undermined by climate change. Two dominant counternarratives have been emerging. Physical science demonstrates the limited empirical evidence at the moment for SIDS being destroyed due to climate change. Notwithstanding that such empirical evidence could appear in the future, social science counternarratives are challenging notions of SIDS' peoples inevitably fleeing their homes as climate refugees. Instead, SIDS' peoples have strong abilities and desires to make their own mobility decisions, whether due to climate change or other impetuses. Consequently, islandness within SIDS' climate change narratives is not necessarily problematic, but instead can help islanders address climate change and wider challenges. The counternarratives, even if not entirely contradicting the dominant narratives, provide needed nuances, balance, and contextualisation to provide a full picture of SIDS, islandness, and climate change.
6	Accountability in climate change governance and Caribbean SIDS	Scobie, M.	Environment Development and Sustainability	2018	10.1007/s10668-017-9909-9	4	The paper examines the nature of accountability in climate change governance using the Caribbean region as a case study.
1	Multiple stressors impacting a small island tourism destination-community: A nested vulnerability assessment of Oistins, Barbados	Moghal, Z.; O'Connell, E.	Tourism Management Perspectives	2018	10.1016/j.tmp.2018.03.004	4	This study examines the multiple stressors impacting a tourism community, based on 48 interviews and five focus groups, with local and national stakeholders in Oistins, Barbados.
10	Competing knowledge systems and adaptability to sea-level rise in The Bahamas	Petzold, J.; Ratter, B.M.W.; Holdschlag, A.	Area	2018	10.1111/area.12355	4	By means of qualitative and quantitative empirical research on The Bahamas, we show how different knowledge systems translate into different modes of responding to specific environmental pressures, such as sea-level rise. The understanding of historicity and temporality, experience and learning processes, and institutional settings, which frame people's knowledge of their environment, is important for understanding potentials for adaptability.
6	Perceptions of climate change risk in The Bahamas	Thomas, A.; Benjamin, L.	Journal of Environmental Studies and Sciences	2018	10.1007/s13412-017-0429-6	6	The study provides analysis of how climate change is perceived by this subset of the population and potential links with how these perceptions can guide policymaking and risk communication strategies
6	Knowledge, perceptions, concerns, and behaviors to climate change-the Caribbean context: an introduction	Thomas, A.; Baptiste, A.K.	Journal of Environmental Studies and Sciences	2018	10.1007/s13412-017-0462-5	8	This symposium aims to address the research gap in studies exploring knowledge, perceptions, concerns, and behaviors to climate change for Caribbean SIDS. The five papers of the symposium explore these issues from different viewpoints, for different stakeholders and for a number of islands in the region. This introduction to the symposium details the importance of understanding how community members engage in climate change issues and provides an overview of the articles included as part of the symposium.
13	Knowledge, attitudes and practices of climate adaptation actors towards resilience and transformation in a 1.5 degrees C world	Saxena, A.; Qui, K.; Robinson, S.A.	Environmental Science & Policy	2018	10.1016/j.envsci.2017.11.001	4	Using the case of Caribbean small island developing states, we qualitatively analyze in-depth interviews with 35 climate change donors and project implementers.
2	Gathering at the AOSIS: perceived cooperation among Pacific Small Island States	Schwebel, M.B.	International Environmental Agreements: Politics, Law and Economics	2018	10.1007/s10784-017-9379-4	4	The Association of Small Island States occupies a unique role at the United Nations (UN) whereby it advocates on behalf of islands states (and those with similar geographies) on issues from climate change to development to economic initiatives and trade. As part of a larger research endeavor, interviews were conducted with the AOSIS representative (or a knowledgeable delegate) from over a dozen Pacific Small Island States (PSIS) with regard to climate change planning and preparation. This research is unique in that approximately three-quarters of the sought-after island states agreed to give anonymous, non-attributable interviews about diplomatic and sensitive topics.
3	Sustainability of Smallholder Livelihoods in the Ecuadorian Highlands : A Comparison of Agroforestry and Conventional Agriculture Systems in the Indigenous Territory of Kayambi People	Córdova, R.; Hogarth, N. J.; Kanninen, M.	Land	2018	10.3390/land7020045	4	This study uses a combination of biophysical and socioeconomic data based on household interviews to compare 30 highland agroforestry systems and 30 conventional agriculture systems, to determine which system provides better conditions to support sustainable livelihoods for smallholder farmers.
3	Cross sectoral impacts on water availability at +2°C and +3°C for east mediterranean island states: the case of Crete	Koutroulis, A. G.; Grillakis, M. G.; Daliakopoulos, I. N.; Tsanis, I. K.; Jacob, D.	Journal of Hydrology	2018	10.1016/j.jhydrol.2015.11.015	4	Here we use a generalized cross-sectoral framework to assess the impact of climatic and socioeconomic futures on the water resources of an Eastern Mediterranean island. A set of representative regional climate models simulations from the EURO-CORDEX initiative driven by different RCP2.6, RCP4.5, and RCP8.5 GCMs are used to form a comparable set of results and a useful basis for the assessment of uncertainties related to impacts of 2° warming and above.
3	People's perception on agricultural vulnerabilities to climate change and SLR in Bangladesh: adaptation strategies and explanatory variables	Islam, M.A.	International Journal of Agricultural Research, Innovation and Technology	2018	10.3329/ijarit.v8i1.38232	4	The objective of this research is to evaluate people's perception on vulnerabilities of agriculture and to explore effective adaptation options with identifying the underlying demographic, socio-economic and other relevant variables that influence the adaptation strategies in the sea level rise (SLR) hazard induced coastal areas of Bangladesh.
3	Using climate analogue tools to explore and build smallholder farmer capacity for climate smart agriculture	Opare, P.; Akintonde, J. O.; Obeng-Ofori, D.;Nelson, V.	AAS Open Research	2018	10.12688/aasopenres.12822.1	6	Location in urban area.
3	Climate change vulnerability analysis of smallholder farmers in Enugu state Nigeria: Gender sensitive approach	Chukwuemeka, S. U.; Kingsley, O. A.	Journal of Aridland Agriculture	2018	10.25081/jaa.2018.v4.3374	4	A study was conducted to understand adaptive capacity profiles of male and female farmers, about the climate change vulnerability.
3	Fostering environmental communication and human development through african indigenous knowledge: the example of selected Ibibio folksongs	Inyang, O.	International Review of Humanities Studies	2018	10.7454/irhs.v2i1.21	4	This paper titled Fostering Environmental Communication and Human Development through African Indigenous Knowldege: The Example of Selected Ibibio Folksongs takes a look at how the folklores and songs of Ibibio people of Akwa Ibom State Nigeria are incorporated into performance signification of environmental information and education and its implication in the globalised environment of the twenty first century and the current crusade for environmental sustainability in Africa.
3	Climate change and maize agriculture among Chepang communities of Nepal: A review	Sharma, P.;Kattel, R. R.; Subedi, A. P.	Journal of Maize Research and Development	2018	10.3126/jmrd.v3i1.18922	8	This paper reviews recent literature concerning effects of climate change on agriculture and its agricultural adaptation strategies, climate change impacts on Chepang communities and their maize farming.
3	Food and Nutritional Security Status: Assessment among Landless People in Chitwan, Nepal	Poudel, D.; Dhungana, S.; Tripathi, K. M.; Kaphle, K.; Sah, S. K.	International Journal of Applied Sciences and Biotechnology	2018	10.3126/ijasbt.v6i4.21254	4	A pilot study was conducted within ninety households of four different locations with the purpose to assess various dimensions of food and nutritional security of the landless people living in undocumented land by purposive selection of Chitwan District of Nepal.

3	Nutrition Intervention as Service Learning: Silliman University's Indigenous Food Security in Philippine High Risk Calamity Areas	Aclaro-Naranjo, M.; Mana-ay, A. K. A.; Honculada-Genove, J.; Entea, R. A. S.	EDP Sciences	2018	10.1051/shsconf/20185901020	4	A collaborative effort between Silliman University Nutrition and Dietetics Department- through Service-Learning and the local government units became a means to reduce social inequalities in disastrous situations. The goal of this project was to immerse students in a community to prepare selected community members to cope with emergency nutritional needs, and to teach them food preservation techniques using available indigenous foods.
3	Choosing not to choose: A meta-analysis of status quo effects in environmental valuations using choice experiments ; Eligiendo no elegir: meta-análisis de los efectos de status quo en la valoración del medioambiente usando experimentos de elección	Barreiro-Hurle, J.; Espinosa-Goded, M.; Martinez-Paz, J. M.; Perni, A.	Economía Agraria y Recursos Naturales-Agricultural and Resource Economics	2018	10.7201/earn.2018.01.04	4	In this paper, we conduct a meta-analysis of DCE applied in environmental policy to identify potential drivers of SQE.
3	Impact of Climate Change on Smallholder Dairy Production and Coping Mechanism in Sub-Saharan Africa-Review	Tadesse, G.	Advances in Life Science and Technology	2018		4	The objective of this review is to appraisal the impact of climate change on smallholder dairy production and coping mechanism in sub-Saharan Africa.
3	Climate Change Adaptation Strategies of Smallholder Farmers: The Case of Bedele District, Bunno Bedele Zone, Oromia Region, Ethiopia	Jeldu, F. A.; Ochocho, A.; Duguma, A. L.	Journal of Environment and Earth Science	2018		4	The objective of this study was to identify farmers' adaptation strategies and determinants of climate change adaptation strategies in Bedele district, Western Ethiopia.
3	To examine coping adaptive strategies used by households and make policy recommendations for addressing future climate change impacts on livelihoods in Kapsokwony Division, Mt. Elgon Sub-county, Bungoma County, Kenya	Bonzemo, S. B.	International Journal of Educational Studies	2018		4	The purpose of this study was to build new transformation knowledge by integrating the traditional and the modern adaptive technologies in order to transform lives of the indigenous communities in the study area. This paper therefore explores and highlights the existing and modern technologies which can be employed by farmers to counteract the impacts of climate change and climate variability.
3	To Determine the Sustainability of Livelihoods Impacted by Climate Change in Kapsokwony Division, Mt. Elgon Sub-county, Bungoma County, Kenya	Bonzemo, S. B.	Journal of Education and Practice	2018		4	The research therefore highlights the existing scientific and indigenous technologies to counter the impacts of climate change in the study area. The collaborative research is characterized by top – bottom and bottom – top integrated research structure and entails dialogue by all the stakeholders
3	Climate Change: Impacts and Adaptation in Rural Community of Benishangul Gumuz Regional State, Western Ethiopia	Morka, A.	Research on Humanities and Social Sciences	2018		4	Therefore this study, aimed to explain impacts and adaptation mechanisms to climate change in the State of Benshangul Gumuz Region.
3	Supporting Indigenous rangers manage the impacts of climate change on cultural sites	Carmichael, B.	Australian National University	2018	10.25911/5d612070200bf	4	Thesis PhD. This research aimed to develop a Cultural Site Adaptation Guide (the Guide), a decision support tool to assist non-specialists undertaking participatory, climate change adaptation planning for cultural sites.
3	Social Differences in the Vulnerability and Adaptation Patterns among Smallholder Farmers: Evidence from Lawra District in the Upper West Region of Ghana	Abass, A. Y.; Mensah, A.; Salifu, M.; Owusu, K.	Journal of Economics and Sustainable Development	2018		4	This study sought to assess the perception of vulnerability and adaptation strategies of socially differentiated groups of smallholder farmers to climate change in Lawra district, north-western Ghana.
3	Farmers' Perception on Land Degradation and Adoption of Soil-Water Conservation Measures in Ethiopian Highlands: Review Article	Abdeta, G. C.	Journal of Resources Development and Management	2018		8	This paper is aimed to review farmers' perception on land degradation and adoption of soil-water conservation measures in Ethiopian highlands.
4	Political economy of planned relocation: A model of action and inaction in government responses	Mortreux, C.; de Campos, R.S.; Adger, W. N.; Ghosh, T.; Das, S.; Adams, H.; Hazra,S.	Global Environmental Change	2018	10.1016/j.gloenvcha.2018.03.008	4	Here we develop a conceptual framework to examine the factors that influence government decision-making about whether or not to undertake planned relocation of populations in the context of environmental change. The study examines planned relocation decisions and non-decisions by government agencies in West Bengal in India for communities seeking relocation due to coastal flooding.
4	Constraints to smallholder agricultural production in the Western Cape, South Africa	Ncube, B.	Physics and Chemistry of the Earth, Parts A/B/C	2018	10.1016/j.pce.2018.05.012	4	The research sought to untangle some of the complexities of improving smallholder farmer livelihoods in the Breede-Gouritz Catchment Management Area (BGCMA) in the Western Cape, one of the first two catchment management areas to be created in South Africa. The main aim of the study was to assess constraints in addition to water, to the success of smallholder farmers in improving livelihoods.

Apêndice H – Lista das definições explícitas de percepção (na íntegra).

Source	Title	Author	Journal	Year	DOI	Definition term
6	How do farm size and perceptions matter for farmers' adaptation responses to climate change in a developing country? Evidence from Nepal	Koirala, P.; Kotani, K.; Managi, S.	Economic Analysis and Policy	2022	10.1016/j.eap.2022.01.014	"Climatic perception is defined as a state of opinions and/or awareness toward the changes in climate variables (Ruiz et al., 2020)".
6	Extreme hydroclimatic events in rural communities of the Brazilian Amazon: local perceptions of change, impacts, and adaptation	Almudi, T.; Sinclair, A.J.	Regional Environmental Change	2022	10.1007/s10113-021-01857-0	"Based on the IPCC's (2018:557) definition of "risk perception," we consider "perceptions of change" as "the subjective judgment that people make about the characteristics and severity of changes.""".
6	Role of Homestead Forests in Adaptation to Climate Change: A Study on Households' Perceptions and Relevant Factors in Bandarban Hill District, Bangladesh	Baul, T.K.; Peuly, T.A.; Nandi, R.; Kar, S.; Karmakar, S.	Environmental Management	2022	10.1007/s00267-022-01598-8	"Perception is the process of receiving information from the ambient environment and transforming it into physiological awareness for taking adaptation and mitigation strategies towards adverse impacts of climate change in the agroecological system (Bryan et al. 2009). However, this process could vary with the individual's past experiences, observations, and present attitudes, needs, and social circumstances and also depending on one´s livelihood, literacy, and settlement (Baul et al. 2013; Baul and McDonald 2015; Chapagain et al. 2009)".
6	Community perceptions of climate change and ecosystem-based adaptation in the mangrove ecosystem of the Rufiji Delta, Tanzania	Nyangoko, B.P.; Berg, H.; Mangora, M.M.; Shalli, M.S.; Gullström, M.	Climate and Development	2022	10.1080/17565529.2021.2022449	"perceptions of climate change were defined as people's perspectives on local-scale changes in the state of weather-related factors, such as increased temperature, prolonged droughts, sea level rise, changes in precipitation patterns and large floods in a given area over the last decade (Makame & Shackleton, 2020), which if they persist over long periods of time become indications of climate change (Pachauri et al., 2014)".
2	Factors Influencing Choice of Climate Change Adaptation Methods among Underutilized Indigenous Vegetable farmers	Ekemini-Richard, M.; Ayanwale, A.B.; Adelegan, O.J.	International Journal of Vegetable Science	2022	10.1080/19315260.2020.1848960	"To farmers, climate change is not perceived in terms of major disasters, but rather as increased uncertainty, such as shifts in onset of rain at planting or end of rain at harvest (Sthapit and Padulosi, 2011)".
1	Farmers' behaviors and attitudes toward climate change adaptation: evidence from Vietnamese smallholder farmers	Tiet, T.; To-The, N.; Nguyen-Anh, T.	Enviroment Development and Sustainability	2022	10.1007/s10668-021-02030-7	"risk perception (i.e., person's subjective judgment or assessment of risk)".
1	Determinants of Farmers' Risk Perceptions of Hailstorms in Northern Bangladesh: Is Adaptive Capacity the Major Concern?	Raihan, M.L.; Basu, M.; Onitsuka, K.; Hoshino, S.	Polish Journal of Environmental Studies	2022	10.15244/pjoes/135699	"According to Sjoberg (1998), the perception of risk is a subjective judgement of the likelihood of a respective event such as flood, drought, cyclone, etc. and stakeholders' subsequent awareness of its level of damage [30]. (...) The study defines hailstorm risk perceptions as concerns shown by farmers regarding previous, present, and future incidents of negative impacts on crop production and agricultural activities due to the occurrence of hailstorms".
10	Livelihood Capitals, Income Inequality, and the Perception of Climate Change: A Case Study of Small-Scale Cattle Farmers in the Ecuadorian Andes	Torres, B.; Cayambe, J.; Paz, S.; Ayerve, K.; Heredia-R, M.; Torres, E.; Luna, M.; Toulkeridis, T.; García, A.	Sustainability (Switzerland)	2022	10.3390/su14095028	"It is fundamental to consider that the perception of climate change is a complex process that encompasses a variety of psychological constructs, such as the knowledge, beliefs, attitudes, and concerns about whether and how the climate is changing [145]. Perception is influenced and shaped by, among other things, the characteristics of individuals, their experiences, the information they receive, and the cultural and geographic contexts in which they live [145,146]".
10	Perception matters: an Indigenous perspective on climate change and its effects on forest-based livelihoods in the Amazon	Bauer, T.N.; de Jong, W.; Ingram, V.	Ecology and Society	2022	10.5751/ES-12837-270117	"The local perspective comprises perceptions of changing weather patterns, related traditional ecological knowledge (TEK), and experiences of an extreme precipitation event, which all influence local decision making in natural resource management matters (Pyhälä et al. 2016)".
6	Individual and community perceptions of climate change in Lower Mustang, Nepal	Bom, U.; Tiefenbacher, J.; Belbase, S.	Environment, Development and Sustainability	2022	10.1007/s10668-022-02291-w	"In this sense, public perception of climate change can be interpreted in a temporal context. (...) In this sense, people's experiences of weather events over time form their perceptions (Capstick et al., 2015). Therefore, public perception of climate change may relate to past experiences, current phenomena, and predictions of what will happen and how it will affect their lives (Shum, 2011)".
2	Perceptions and adaptation strategies for climate change from small ruminant in North-West Cameroon	Tendonkeng, F.; Arnaud, H.T.B.; Noumbissi, M.N.B.; Miégoué, E.; Sawa, C.; Essie, F.M.N.; Mboko, A.V.; Tovignon, G.Z.; Nde, A.N.; Tedonkeng, E.P.; Vargas-Bello-Pérez, E.	Tropical and Subtropical Agroecosystems	2022		"Smallholder farmers perceptions of changes in both temperature and rainfall revealed that perceptions are made based on local environment and are not linked to an understanding of climate change and variability in the national or global contexts (Munthali et al., 2016)."
10	Indigenous Kinabatangan Perspectives on Climate Change Impacts and Adaptations: Factors Influencing Their Support and Participation	Pimid, M.; Nasir, M.R.M.; Scian, J.; Ahmad, A.G.; Mutalib, A.H.A.; Perijin, J.	Sustainability	2022	10.3390/su14116459	"The perceptions are usually understood by examining how climate variability (e.g., temperature and precipitation) and climate hazards (e.g., drought, storms, and floods) impact Indigenous livelihoods and wellbeing [9,14]."
6	Spatiotemporal Changes in Mean and Extreme Climate: Farmers' Perception and Its Agricultural Implications in Awash River Basin, Ethiopia	Damtew, A.; Teferi, E.; Ongoma, V.; Mumo, R.; Esayas, B.	Climate	2022	10.3390/cli10060089	"Essentially, climate change and extreme events perception are complex processes that encompass a range of psychological constructs, such as knowledge, beliefs, attitudes, and concerns about whether and how the climate is changing [32,33]."
6	Farmers' Perception of Climate Change and Climate-Smart Agriculture in Northern Benin, West Africa	Moutouama, F.T.; Tepa-Yotto, G.T.; Agboton, C.; Gbaguidi, B.; Sekabira, H.; Tamò, M.	Agronomy	2022	10.3390/agronomy12061348	"According to the encyclopedia of qualitative research methods [18], perception is like a set of lenses through which an individual views reality. In this study, the perception of climate change was assessed through the frequency of "awareness" or "knowledge" of climate change and how the interviewees observe the changes in temperature, rainfall, and spatial–temporal distribution of rain."
6	Indigenous knowledge indicators employed by farmers for adaptation to climate change in rural South Africa	Kom, Z.; Nethengwe, N.S.; Mpandeli, S.; Chikoore, H.	Journal of Environmental Planning and Management	2022	10.1080/09640568.2022.2086854	"This paper used perception as a way of everyday and long-term interaction with the farmers to process raw data into actual trends."
1	Climate Variability in the Sudanian Zone of Cote d'Ivoire: Weather Observations, Perceptions, and Adaptation Strategies of Farmers	Timite, N.; Kouakou, A.T.M.; Bamba, I.; Barima, Y.S.S.; Bogaert, J.	Sustainability	2022	10.3390/su141610410	"Perception refers to the process in which people receive information and stimuli from their environment and transform them into conscious psychological actions [55]."
10	Smallholder farmers' behavioral preferences under the impact of climate change: A comparative analysis of two agricultural areas in China	Peng Y.; Xu Z.; Wei P.; Cheng L.	Frontiers in Earth Science	2022	10.3389/feart.2022.1010733	"Risk perceptions are beliefs about potential harm or the possibility of a loss. This is a subjective judgment that people make about the characteristics and severity of a risk. In the study, risk

Source	Title	Author	Journal	Year	DOI	Definition term
						perception was considered to be a subjective judgment made by farmers regarding the characteristics and severity of the risks brought about by climate change."
16	Associating farmers' perception of climate change and variability with historical climate data	Ezeh, J. O.; Madukwe, E. U.; Ezeh, C. U.	Journal of Agricultural Sciences	2022	10.2298/JAS2203299E	"Perception in this content entails the approaches through which the people understand their environment and so can utilise the environmental resources and acquire the capability to adapt to the stimuli that may arise from their interactions."
31	Knowledge of climate change and adaptation by smallholder farmers: evidence from southern Ethiopia	Belay A.; Oludhe C.; Mirzabaev A.; Recha J.W.; Berhane Z.; Osano P.M.; Demissie T.; Olaka L.A.; Solomon D.	Heliyon	2022	10.1016/j.heliyon.2022.e12089	"Recent literature revealed that climate change perception is a challenging process that involves psychological concepts, such as attitudes,beliefs, and concerns on how climate change is happening (Fierros--Gonzalez and Lopez-Feldman, 2021). Perception, in this case, refers to people's understanding of the reality and causes of climate change, its consequences, and the factors that determine the decision to apply appropriate measures (van Valkengoed et al., 2021)".
6	Climate Change Perceptions and Adaptation Strategies: A Mixed Methods Study with Subsistence Farmers in Rural Peru	Landaverde R.; Rodriguez M.T.; Niewoehner-Green J.; Kitchel T.; Chuquillanqui J.	Sustainability (Switzerland)	2022	10.3390/su142316015	"Perceptions about CC are "a complex process that encompasses a range of psychological constructs such as knowledge, beliefs, attitudes, and concerns about if and how the climate is changing" ([17], p. 2)".
1	Climate change and the Western Himalayan community: Exploring the local perspective through food choices	Das, S; Mishra, AJ	Ambio	2022	10.1007/s13280-022-01810-3	"The degree of awareness for climatic variabilities is time and space context-specific, which varies according to local communities' own experiences with their ecosystem. The preliminary knowledge of climate change comes from the direct observation of the environment and its physical consequences."
1	Impacts of Climate Change on the Lives of Riverine Farmers on the Lower Rio Negro, Amazon	de Vasconcelos, MA; Pereira, HD; Lopes, M; Guimaraes, DFD	Atmosphere	2022	10.3390/atmos13111906	"Environmental perception is the response of the senses to environmental stimuli (sensory perception) and the mental activity resulting from the relationship with the environment (cognitive perception) [51]."
6	Changes in the environment from perspectives of small-scale farmers in remote Vietnam	Nguyen-Anh, T.; Nong, D.; Leu, S.; To-The, N.	Regional Environmental Change	2021	10.1007/s10113-021-01835-6	"Farmers' perception, which is a cognitive driving force".
6	Determinants of farmers' perceptions of climate variability, mitigation, and adaptation strategies in the central highlands of Kenya	Mairura, F.S.; Musafiri, C.M.; Kiboi, M.N.; Macharia J.M.; Ng'etich O.K.; Shisanya C.A.; Okeyo J.M.; Mugendi D.N; Okwuosa, E.A.; Ngetich, F.K.	Weather and Climate Extremes	2021	10.1016/j.wace.2021.100374	"Farmers' perception of climate variability is a complex process that includes a range of psychological constructs such as knowledge, beliefs, attitudes, and practices related to how the local climate has varied (Whitmarsh and Capstick, 2018). Farmers' perception of climate variability is shaped by farm household characteristics, historical experiences with local climates especially the impact of climatic changes on agriculture productivity, the knowledge that they receive, socio-cultural and geographic contexts where farmers cultivate their fields (Whitmarsh and Capstick, 2018). In this study, farmers' perception of climate variability was defined by their experiences during the decade which preceded the survey in Tharaka-Nithi County (2007-2017) regarding seven climatic characteristics and several consequences that they had experienced as a result of climate variability. These indicators included change in temperature, change in rainfall amounts, change in rainfall onset and rainfall cessation dates, change in length of the cropping season, and changes in flooding and drought frequency. The consequences of climate variability that shaped farmers' perceptions in Tharaka-Nithi County included changes in soil fertility and soil erosion risks, changes in agricultural productivity, and changes in natural and planted forest cover".
10	Smallholder farmers' perceived climate-related risk, impact, and their choices of sustainable adaptation strategies	Mamun, A.A.; Roy, S.; Islam, A.R.M.T.; Monirul Alam G.M.; Alam E.; Pal S.C.; Sattar, M.A.; Mallick, J.	Sustainability (Switzerland)	2021	10.3390/su132111922	"Climate change risk perception is a multitask procedure that depends on different factors including socio-economic, demographic, political, and cultural activities [54]. Overall, personal understanding leads to a pivotal role in identifying farmers' perceived climate-related risks".
11	Climate change perception and impact of on-farm demonstration on intensity of adoption of adaptation strategies among smallholder farmers in South Africa	Ojo, T.O.; Ogundeji, A.A.; Belle, J.A.	Technological Forecasting and Social Change	2021	10.1016/j.techfore.2021.121031	"CCP (climate change perception) can be defined as the stage at which a household perceives changes in climatic conditions".
6	Indigenous knowledge about climate change and sustainability of nomadic livelihoods: understanding adaptability coping strategies	Ghazali, S.; Azadi, H.; Janečková, K.; Sklenička P.; Kurban, A.; Cakir, S.	Environment, Development and Sustainability	2021	10.1007/s10668-021-01332-0	"Perception is described as the process of creating experiential feelings in the real world (Lindsay & Norman, 2013) and highlighting an individual's ability to take advantage of his experience of nature and natural variables (Hartig et al., 2001)".
6	Perceptions, vulnerability and adaptation strategies for mitigating climate change effects among small livestock herders in Punjab, Pakistan	Faisal, M.; Abbas, A.; Cai, Y.; Ali A.; Shahzad M.A.; Akhtar S.; Raza M.H.; Ajmal M.A.; Xia C.; Sattar, S.A.; Batool, Z.	International Journal of Environmental Research and Public Health	2021	10.3390/ijerph182010771	"perception of CC is a personal assessment [25] that comprises an individual's understanding, which in turn motivates actions with respect to CC incidence and severity [26]. Thus, an individual must perceive CC before responding to it, and this perception needs to be linked with actual CC for effective adaptation measures". (...) The perception of risk is a mental construct and personal perception may vary among individuals [82]".
10	Indigenous farmers' perception of climate change and the use of local knowledge to adapt to climate variability: A case study of Vietnam	Manh, N.T.; Ahmad, M.M.	Journal of International Development	2021	10.1002/jid.3573	"Farmers' perceptions consider farmers' observation of changes in climate and climatic events over a long period (Soubry et al., 2020). Furthermore, perception refers to the practical knowledge rising from experience and concrete situations; and perception is also linked to local knowledge (Gupta, 2012) (...) In this paper, farmers' perception of climate change is defined as the farmers' perception of changes in the climate based on observation and individual experience in relation to the increase, decrease or no change in rainfall, temperature, and extreme weather events over a long period of time".
6	Ethnic minority farmers' perceptions and use of local knowledge to adapt to climate change: Some insights from Vietnam	Manh, N.T.; Ahmad, M.M.	Singapore Journal of Tropical Geography	2021	10.1111/sjtg.12397	"Furthermore, perception is the practical knowledge arising from experiences and concrete situations; and perception is also linked to local knowledge. In this paper, farmers' perceptions of climate change are defined as the farmers' understanding of climate change based on observations and individual experiences in relation to the increase, decrease or status quo in rainfall, temperature and extreme weather events over a long period of time".
6	Land-use and climate related drivers of change in the reindeer management system in Finland: Geography of perceptions	Rasmus, S.; Wallen, H.; Turunen, M.; Landauer, M.; Tahkola, J.; Jokinen, M.; Laaksonen, S.	Applied Geography	2021	10.1016/j.apgeog.2021.102501	"Perceptual geography is characterized by a common idea that experience affects perception, which leads to the conclusion that perceptions vary because individuals' life experiences differ (Tuan, 2003). Perceptions are understood as points of contact between people and their environment and as a basis for spatial reasoning and decision making. Perception is the process that encodes the objective environment as a subjective one (Golledge & Stimson, 1997), with the

Source	Title	Author	Journal	Year	DOI	Definition term
						subjective environment and past experiences influencing our behaviour and actions (Sonnenfeld, 1972; Guelke, 2003)". (...) Perceptions also carry culture, and local and traditional knowledge (Forbes et al., 2020; Jaakkola et al., 2018). This means knowledge and practices, developed during centuries and handed down from generation to generation (Berkes 2008)".
6	Linking risk preferences and risk perceptions of climate change: A prospect theory approach	Villacis, A.H.; Alwang, J.R.; Barrera, V.	Agricultural Economics (United Kingdom)	2021	10.1111/agec.12659	"Risk perceptions refer to a decision maker's assessment of the risk inherent in a situation. They are important determinants of decision maker behavior as studies have shown they can influence the assessment of uncertainty and distort one's judgments, knowledge, and the ability to perform under risky conditions (Lusk et al., 2014; Lusk & Coble, 2005; Sitkin & Pablo, 1992;Waterfield et al., 2020). They are generally measured by asking about the perceived "seriousness," "concern," and/or "worry" of a situation". (...) In the psychology literature, perception refers to the process of receiving information and stimuli from one's surroundings and converting them into psychological responses (Garner et al., 1956). The perception of risk is, therefore, a mental construct (Sjöberg, 2000) that distinguishes between the existence of objective real-world threats and the subjective evaluation of those threats (Rosa, 2003; van der Linden, 2017)".
6	Are perception and adaptation to climate variability and change of cowpea growers in Mali gender differentiated?	Diarra, F.B.; Ouédraogo, M.; Zougmoré, R.B.; Partey, S.T.; Houessionon, P.; Mensah, A.	Environment, Development and Sustainability	2021	10.1007/s10668-021-01242-1	"The theoretical context of climate change perception is built on observation, personal experience and information received from the surroundings/neighborhood over a period of time".
6	Comparative Analysis of Meteorological Records of Climate Variability and Farmers' Perceptions in Sekota Woreda, Ethiopia	Behailu, G.; Ayal, D.Y.; Zeleke, T.T.; Ture, K.; Bantider, A.	Climate Services	2021	10.1016/j.cliser.2021.100239	"Perception has been defined as the process by which organisms interpret and organize sensation to produce a meaningful experience of the world (Lindsay and Norman, 1972); and that a person's perceptions are based on experiences with natural and other environmental factors that vary in the extent to which such perceptions are enabled (Hartig et al., 2001). Farmers' perception of climate variability refers to their lived experiences about fluctuations in weather patterns (especially rainfall, temperature, and drought) and how that affected their livelihoods (Piya et al., 2013; Osbahr et al., 2011; Patt and Schroter, 2008)".
6	Regional mapping of climate variability index and identifying socio-economic factors influencing farmer's perception in Bangladesh	Rabbi, S.E.; Shant, R.; Karmakar, S.; Habib, A.; Kropp, J.P.	Environment, Development and Sustainability	2021	10.1007/s10668-020-01104-2	"Perception is defined as a process of receiving information and stimuli from our surroundings and converting those into psychological responses. However, individual perception differs with time and situation and particularly, perception of climate change is a difficult idea for the farmers (Uddin et al. 2017)".
6	Climate change risk perceptions and agricultural adaptation strategies in vulnerable riverine char islands of Bangladesh	Ahmed, Z.; Guha, G.S.; Shew, A.M.; Alam, G.M.M.	Land Use Policy	2021	10.1016/j.landusepol.2021.105295	"Risk perception is a mental construct (Sjoberg, 2000) and farmers' climate change risk perceptions are unique in a sense that it allows for a differentiation between the actual real-world hazards, for instance, climate change, and intuitive evaluation of those dangers (Rosa, 2003; Cutter, 1996)".
6	Climate change and variability perceptions and adaptations of pastoralists' communities in the Maasai Steppe, Tanzania	Nnko, H.J.; Gwakisa, P.S.; Ngonyoka, A.; Estes, A.	Journal of Arid Environments	2021	10.1016/j.jaridenv.2020.104337	"In this study, perception is defined as the way in which climate change and variability is regarded, understood, or interpreted by local people. Perception is of particular interest because of its ability to enhance solutions for risky climate events or otherwise (Maddison, 2006)".
10	Understanding climate change and drought perceptions, impact and responses in the rural Savannah, West Africa	Adaawen, S.	Atmosphere	2021	10.3390/atmos12050594	"Risk perception involves the "subjective assessment of the probability of a specified type of accident (or event) happening and how concerned we are with the consequences" [28] (p. 80)".
10	Responses of the Tharu to climate change-related hazards in the water sector: Indigenous perceptions, vulnerability and adaptations in the western Tarai of Nepal	Chaudhary B.R.; Acciaioli G.; Erskine W.; Chaudhary P.;	Climate and Development	2021	10.1080/17565529.2021.1889947	"Climate perception is a process by which individuals sense and realise changes in climate-related stimuli, where stimuli include changes in climate variables and extremes (IPCC, 2014a)".
6	The importance of climate change awareness for the adaptive capacity of ethnic minority farmers in the mountainous areas of Thua Thien Hue province	Sen, L.T.H.; Bond, J.; Phuong, L.T.H.; Winkel, A.; Tran, U.C.; Le, N.V.	Local Environment	2021	10.1080/13549839.2021.1886064	"Climate change awareness involves creating knowledge, understanding and values, attitude, skills, and abilities among individuals and social groups towards the issues of climate change for attaining a better quality environment (Ekpoh and Ekpoh, 2011). (...) In this study, awareness of climate change was measured by an index of four groups of statements adopted from Marshall et al. (2013) and West Sussex County Council (2005), including (I) conceptual awareness; (ii) experiential awareness; (iii) engagement awareness, and (iv) adaptation awareness. Conceptual awareness regards an individual's knowledge on the causes of climate change; their impacts and the necessity for a response. Experiential awareness concerns experiences and knowledge of long-term changes in climatic conditions and associated impacts on the availability of resources and livelihoods. Engagement awareness is about the frequency with which an individual talks or hears about climate change, while adaptation awareness refers to knowledge on climate forecasting, adaptation techniques and climate response policies".
6	Livestock farmers' perception and adaptation to climate change: panel evidence from pastoral areas in China	Yang, S.; Yu, L.; Leng, G.; Qiu, H.	Climatic Change	2021	10.1007/s10584-021-02992-7	"We differentiate between perceptions of climate change in short and long term. Short-term perception is defined as the perception of extreme weather events in the past year, whereas long-term perceptions are perceived changes in temperature and rainfall over the last 20 years".
1	Knowing the Clouds through the Land: Perceptions of Changes in Climate through Agricultural Practices in Two Nahua Indigenous Communities	Martinez-Herrera, G.; Trejo, I.; Moreno-Calles, A.I.; de Alba-Navarro, M.F.; Martinez-Balleste, A.	Journal of Ethnobiology	2021	10.2993/0278-0771-41.3.849	"According to Ingold (2000, 2011), perception is mediated by and modified through interaction with the environment, historical background, and personal or lived experiences. In the context of climate change, perception is often studied as the process of acquiring information about one's environment and how it enhances climate awareness (Karki et al. 2019)".
3	Determinants of climate change adaptation and perceptions among small-scale farmers of Embu County, Eastern Kenya	Kangai, R.; Chitechi, E. W.; Koske, J.; Waswa, B.; Ngare, I.	African Journal of Environmental Science and Technology	2021	10.5897/AJEST2020.2943	"Perception is a process in which stimulus or information is received and transformed to generate a psychological awareness (Ayal and Filho, 2017). This stimulus is formulated based on cultural background, prior experience, and socioeconomic factors."
10	Are smallholder farmers' perceptions of climate variability supported by climatological evidence? Case study of a semi-arid region in South Africa	Rapholo, M.T.; Diko, Makia L.	International Journal of Climate Change Strategies and Management	2020	10.1108/IJCCSM-01-2020-0007	"Farmers' perception of climate change was considered as an aggregated awareness about the trend of the following four climatic parameters (rainfall, temperature, number of rainy days and frequency of dry spells) generated from the historical climate records of the research area".
6	Trends of climate change and variability in three agro-ecological settings in central Ethiopia: Contrasts of meteorological data and farmers' perceptions	Etana, D.; Snelder, D.J.R.M.; van Wesenbeeck, C.F.A.; Buning, T.C.	Climate	2020	10.3390/cli8110121	"farmers' perception refers to short-term experience relying on memories [17]".

Source	Title	Author	Journal	Year	DOI	Definition term
10	Perceived Climate Variability and Compounding Stressors: Implications for Risks to Livelihoods of Smallholder Indian Farmers	Singh, R.K.; Singh, A.; Kumar, S.; Sheoran, P.; Sharma, D.K.; Stringer, L.C.; Quinn, C.H.; Kumar, A.; Singh, D.	Environmental Management	2020	10.1007/s00267-020-01345-x	"In this study, perceptions about climate variability and other stressors were defined as an individual's ability to see, hear and experience (over the period 2000–2015) any one or combination of stressors caused by climatic phenomena alone and/or ecological, socio-economic and political factors affecting activities vital to the farmers' subsistence".
6	Assessing farmers' preparedness to cope with the impacts of multiple climate change-related hazards in the Terai lowlands of Nepal	Budhathoki, N.K.; Paton, D.; A. Lassa, J.; Zander, K.K.	International Journal of Disaster Risk Reduction	2020	10.1016/j.ijdrr.2020.101656	"risk perception is the subjective assessment of the probability of a natural hazard occurring and the consequences of hazards activities (severity) [2,12–14]".
6	Heat, cold, and floods: exploring farmers' motivations to adapt to extreme weather events in the Terai region of Nepal	Budhathoki, N.K.; Paton, D.; Lassa, J.A.; Bhatta, G.D.; Zander, K.K.	Natural Hazards	2020	10.1007/s11069-020-04127-0	"Threat appraisal, also known as risk perception, is the primary cognitive process assessing how an individual is threatened by a specific known risk consisting of perceived probability and perceived severity (the consequences) (Grothmann and Reusswig 2006)."
11	Changing climate - Changing livelihood: Smallholder's perceptions and adaption strategies	Funk, C.; Raghavan Sathyan, A.; Winker, P.; Breuer, L.	Journal of Environmental Management	2020	10.1016/j.jenvman.2019.109702	"Perception is the process of receiving external stimuli and converting them into psychological responses based on past events and the present situation (van den Ban and Hawkins, 1996)".
6	Perceptions and knowledge on climate change in local communities in the Offinso Municipality, Ghana	Sraku-Lartey, M.; Buor, D.; Adjei, P.O.-W.; Foli, E.G.	Information Development	2020	10.1177/0266666918811391	"Perception research, according to Kamau, (2010) thus attempts to understand the complex interrelationships between man and the biosphere since man's actions and decisions concerning the environment are based on objective as well as subjective factors. Perception research is therefore concerned with how individuals or groups perceive their environment and how they react to changes in the environment. Perception is also about the beliefs an individual or a group have about an issue. Perception therefore forms the basis upon which knowledge is derived. (...) Perception therefore helps to determine the social or mental picture of climate change that individuals have and their beliefs about the effects of climate change (Stedman, 2004)".
2	Perception of the impact of climate change on the quality of life and well-being of the inhabitants of the cerro blanco agricultural community, Limarí province, Chile [Percepción del impacto del cambio climático sobre la calidad de vida y el bienestar de los habitantes de la comunidad agrícola cerro blanco, provincia de Limarí, Chile]	Alfaro, A.A.; Cortés, M.E.	Idesia	2020	10.4067/S0718-34292020000400127	"Perception is the first cognitive process through which the individual obtains information from the environment and allows the subject to form a representation of reality (Sánchez and Barraza, 2015)."
6	Small holder farmers' perception and response mechanisms to climate change: Lesson from Tekeze lowland goat and sorghum livelihood zone, Ethiopia	Mihiretu, A.; Okoyo, E.N.; Lemma, T.	Cogent Food and Agriculture	2020	10.1080/23311932.2020.1763647	"Climate change perceptions are the process of receiving information from the environment and transform it into psychological awareness (IPCC, 2014)."
3	Place-based perceptions, resilience and adaptation to climate change by smallholder farmers in rural South Africa.	Tesfuhuney, W. A.; Mbeletshie, E. H.	International Journal of Agricultural Research, Innovation and Technology	2020	10.3329/ijarit.v10i2.51585	"Farmers' perception of climate change refers to an aggregated awareness of the trend in the climatic parameters such as rainfall, temperature, drought and onset and end of the rainy season."
10	Rethinking indigenous climate governance through climate change and variability discourse by a Zimbabwean rural community	Mugambiwa, S.S.; Rukema, J.R.	International Journal of Climate Change Strategies and Management	2019	10.1108/IJCCSM-11-2018-0074	"A plethora of scholars define climate change perceptions as awareness of change in climatic conditions and their impacts on people's livelihoods (Mazvimavi, 2010; Simba et al., 2012; Rankoana, 2016)."
6	Pastoralists' perception of and adaptation strategies for climate change: associations with observed climate variability	Zhang, Q.; Cui, F.; Dai, L.; Feng, B.; Lu, Y.; Tang , H.	Natural Hazards	2019	10.1007/s11069-019-03620-5	"(...) public perception, defined as the process by which the public interprets and organizes sensation to produce a meaningful experience of the world (Ndamani and Watanabe 2015) (...)".
6	Indigenous people's perceptions about climate change, forest resource management, and coping strategies: a comparative study in Bangladesh	Ahmed, M.N.Q.; Atiqul Haq, S.M.	Environment, Development and Sustainability	2019	10.1007/s10668-017-0055-1	"Van den Ban and Hawkins (2000) define perception as the process by which we receive information or stimuli from our environment and transform it into psychological awareness to produce meaningful experiences of the world."
6	Cryospheric hazards and risk perceptions in the Sagarmatha (Mt. Everest) National Park and Buffer Zone, Nepal	Sherpa, S.F.; Shrestha, M.; Eakin, H.; Boone, C.G.	Natural Hazards	2019	10.1007/s11069-018-3560-0	"Perceived probability and perceived severity of a hazard are defined as a person's expectancy of being exposed to threats and how harmful the consequences of the threat would be if it were to actually occur, respectively."
6	Fishers' decisions to adopt adaptation strategies and expectations for their children to pursue the same profession in Chumphon Province, Thailand	Sereenonchai, S.; Arunrat, N.	Climate	2019	10.3390/cli7020034	"Personal perception is what individuals perceive of the local climate instability, climate change and reactions, based on personal experience and values [18]."
6	Climate change perception: an analysis of climate change and risk perceptions among farmer types of Indian Western Himalayas	Shukla, R.; Agarwal, A.; Sachdeva, K.; Kurths, J.; Joshi, P.K.	Climatic Change	2019	10.1007/s10584-018-2314-z	"Perception is a cognative process through which humans interpret experiences of the environment and in turn generate response strategies. Schlüter et al. (2017) highlights that in various behavioral models, perception is the initial receptor stage, i.e., "what comes in" and behavior is the final outcome, i.e., "what goes out."""
6	Indigenous knowledge and farmer perceptions of climate and ecological changes in the bamenda highlands of cameroon: Insights from the bui plateau	Tume, S.J.P.; Kimengsi, J.N.; Fogwe, Z.N.	Climate	2019	10.3390/cli7120138	"Perception is the way of processing raw data that a person receives through his/her daily and long-term interaction with immediate environment into meaningful pattern."
10	Farmers' Perceptions of Climate Change Trends and Adaptation Strategies in Semiarid Highlands of Eastern Tigray, Northern Ethiopia	Kahsay, H.T.; Guta, D.D.; Birhanu, B.S.; Gidey, T.G.; Routray, J.K.	Advances in Meteorology	2019	10.1155/2019/3849210	"Local people's perception of rainfall behavior is an idiosyncratic manifestation of their experience and various environmental aspects [28]".
26	Vulnerability to climate change of smallholder farmers in the Hamadan province, Iran	Jamshidi, O.; Asadi, A.; Kalantari, K.; Azadi, H.; Scheffran, J.	Climate Risk Management	2019	10.1016/j.crm.2018.06.002	"Climate change perceptions include the individuals' views and interpretations of the climate issue based on beliefs, experiences, and understanding (Wolf and Moser, 2011)."
1	Resilience to climate variability: the role of perceptions and traditional knowledge in the Colombian Andes	Vargas, C.A.C.; Romero, S.H.; Leon-Sicard, O.	Agroecology And Sustainable Food Systems	2019	10.1080/21683565.2019.1649782	"Perceptions are complex and dynamic processes that are tied to social experiences and constitute a bridge between lived contexts and the environment (Sánchez 2011)."
3	Less Rain and More Heat": Smallholders' Perception and Climate Change Adaptation Strategies in Tropical Environments	Ramírez, K. D. I.;Ibarra, A. M. A.	Sociedad y Ambiente	2019	10.31840/sya.v0i21.2040	"Perception of climate variability is complex, and involves the opinions, beliefs, values and rules people have regarding climate change, which determine the orientation of their actions, in other words, whether they are positive or negative as regards adaptation."
2	Smallholder farmers' perception to climate change impact on crop production: Case from drought prone areas of Bangladesh	Roy, D.; Kowsari, M.S.; Nath, T.D.; Taiyebi, K.A.; Rashid, M.M.	International Journal of Agricultural Technology	2018		"Perception refers to the process concerned with the acquisition and interpretation of information from one's environment (Maddox, 1995)."
2	Human perception of climate change	Rankoana, S.A.	Weather	2018	10.1002/wea.3204	"Slegers (2008) and Ejembi and Alfa (2012) add that human perceptions of environmental changes are informed by experiences of how the changes influence people's livelihoods."

Source	Title	Author	Journal	Year	DOI	Definition term
11	Climate, the Earth, and God – Entangled narratives of cultural and climatic change in the Peruvian Andes	Scoville-Simonds, M.	World Development	2018	10.1016/j.worlddev.2018.06.012	"As pointed out by an anonymous reviewer, 'perception' and 'understanding' are sometimes synonymous. Yet, the Oxford Living Dictionary contains two distinct definitions of the word perception – 'The ability to see, hear, or become aware of something through the senses,' and 'The way in which something is regarded, understood, or interpreted.'"
10	Farmers' perspectives: Impact of climate change on African indigenous vegetable production in Kenya	Chepkoech, W.; Mungai, N.W.; Stöber, S.; Bett, H.K.; Lotze-Campen, H.	International Journal of Climate Change Strategies and Management	2018	10.1108/IJCCSM-07-2017-0160	"Perception here follows the definition of Ndamani and Watanabe (2015) as the process by which organisms (humans) interpret and organise sensations to produce a meaningful experience of the world."
6	Evaluation of small-scale fishers' perceptions on climate change and their coping strategies: Insights from lake Malawi	Limuwa, M.M.; Sitaula, B.K.; Njaya, F.; Storebakken, T.	Climate	2018	10.3390/cli6020034	"The perception framework is hinged around psychology, which is study of behaviour and mental processes [45]. (...) perceptions are subjective [47] and comprise a wide range of things which are contextual, value-laden and dynamic [38,47]. For example, a definition of a similar event might be different within a group of individuals in with experience, i.e., how individuals react to situations [38]. This is so because perception is a function of the actions displayed thereafter [49]. "
26	Understanding climate change impacts on water buffalo production through farmers' perceptions	Escarcha, J.F.; Lassa, J.A.; Palacpac, E.P.; Zander, K.K.	Climate Risk Management	2018	10.1016/j.crm.2018.03.003	"We defined perceptions as the views and interpretations of the climate change issues based on beliefs, experiences and understanding (Wolf & Moser, 2011)."
26	Climate change adaptation in the western-Himalayas: Household level perspectives on impacts and barriers	Pandey, R.; Kumar, P.; Archie, K.M.; Gupta, A.K.; Joshi, P.K.; Valente, D.; Petrosillo, I.	Ecological Indicators	2018	10.1016/j.ecolind.2017.08.021	"Human perception of the environment shapes and is shaped by human knowledge of the environment, and involves interpretation of events or information; therefore, any landscape consists of two basic elements, the biophysical components of an area affected by human activities and analyzed through "objective" analysis, and the perception and the value assigned to the environment by people, evaluated through "subjective" analysis (Petrosillo et al., 2007, 2013)."
1	Individual Local Farmers' Perceptions of Environmental Change in Tanzania	Roschel, L.; Graef, F.; Dietrich, O.; Schafer, M.P.; Haase, D.	Water	2018	10.3390/w10040525	"Perception of the environment describes how a person perceives the environment through the brain´s and their senses' ability to process and store information. The perceptual process is highly complex, but broken down it consists of six steps: the presence of objects, observation, selection, organization, interpretation, and response [6]. The selection, organization, and interpretation is personalized and driven by internal and external factors. For example, the motivation, personality, or experience of an individual plays a role in how they perceive their surroundings, but also a continued repetition of being exposed to an object or a situation can alter their personal perception."
3	Do Smallholder Farmers Perceive Rainfall Variability the Same and Correctly? Gendered and Spatial Analysis of Perception Versus Actual Trends of Rainfall in Three Livelihood Zones in Kenya	Kiumbuku, S. K.; Baaru, M. W.; Mutinda, J. W.	Journal of Environment and Earth Science	2018		"Perception to climate variability can be associated with both social-cultural construction and psychological dimensions (Weber, 2001; Palmer, 1996; Hansen et al,. 2004). From a social cultural dimension perception it is systematically determined by how people who share a common culture interpret a phenomenon that affects their livelihoods and way of life (Weber, 2001). Psychologically, perceptions may vary from person to person or from group to group. However group differences in perceptions are often larger to result to predictive differences in perception between those groups (Weber & Hsee, 1998). Such group dynamics may be due to gender, culture, livelihood activities, geographical locations, income age and level of education (Hansen et al., 2004). According to Grimberg et al (2018) perception may be shaped by social variables that include culture, political and psychological factors since they all determine how people interact with the natural environment, including their livelihood practices."

Apêndice I – Lista completa da descrição de como a percepção aparece nos resultados.

Column descriptions	
source	Database where the article was published (see codebook)
title	Title of the article
author	Author(s) of the article
journal	Journal where the article was published
year	Year of the article was published
DOI	DOI of the article
description	Description of how the perception appears in the results.

source	title	author	journal	year	doi	description
6	Effects of climate variability on livestock productivity and pastoralists perception: The case of drought resilience in Southeastern Ethiopia	Habte, M.; Eshetu, M.; Maryo, M.; Andualem, D.; Legesse, A.	Veterinary and Animal Science	2022	10.1016/j.vas.2022.100240	"East Guji pastoralists perceived the changing climatic condition in terms of temperature, rainfall and intensity of drought. There is no statistically differ between the perception of pastoral and agropastoral communities at both study location regarding onset of rainy season, temperature pattern, drought intensity, duration and duration of rainfall. Significant (p< 0.05) proportion of the pastoralists in the study area perceived the late onset of the rainy season (p = 0.0005, 72.7%) and increasing patterns of temperature (p <.0001, 82.8%) as compared with constant rainfall and temperature over years. (...) The result of the current finding revealed that significantly higher (p < 0.05) proportions of pastoral and agro-pastoral communities perceived increasing trends of drought intensity (p <.0001, 84.8%) over the years. (...) Similarly, the majority of respondents perceived that the amount of rainfall has being decreasing from year to year and becoming too little in its amounts. (...) Increasing trends of mean annual temperature are consistent with the perception of the majority of the pastoralist who indicated increasing patterns of temperature and warming situation".
6	How do farm size and perceptions matter for farmers' adaptation responses to climate change in a developing country? Evidence from Nepal	Koirala, P.; Kotani, K.; Managi, S.	Economic Analysis and Policy	2022	10.1016/j.eap.2022.01.014	"A majority of farmers has perceived changes in summer temperature, winter temperature, rainfall intensity, rainfall frequency and drought, whereas approximately 50.00 %, 38.00 % and 22.00 % of them perceive cold waves, hot waves and floods, respectively."
19	Smallholders' adaptation to climate change in Western Kenya: Considering socioeconomic, institutional and biophysical determinants	Musafiri, C.M.; Kiboi, M.; Macharia, J.; Ng'etich, O.K.; Kosgei, D.K.; Mulianga, B.; Okoti, M.; Ngetich, F.K.	Environmental Challenges	2022	10.1016/j.envc.2022.100489	"Majority of the smallholder farming households perceived changes across different indicators of climate change . The change ranged between 74% (flooding frequency) to 99% (temperature). Regarding the sign of change, majority of the smallholders farming households perceived that the climate was changing towards the negative including decrease in rainfall frequency (82%), length of cropping calender (95%), and rainfall amount (96%), and an increase in flodding frequency (63%), drought frequency (82%) and temperature (99%). The findings suggested that smallholder farming households understood the indicators of climate change. (...) The study revealed that deforestation (79%) was the main driver of climate change. Smallholder farmers' perceptions on other drivers of climate change were low such as environmental pollution (mainly charcoal burning, 25%), industrialization and agrochemicals (13%), mining (4%), overstocking (4%), poor farming methods (3%) and spiritual beliefs (2%). However, 16% of the farmers were unaware of the drivers of climate change. Smallholder farmers' perception of climate change is pertinent in selecting adaptation practices (Gbetibouo, 2009 ; Mugi-Ngenga et al., 2016). The study revealed a high proportion (96%) of sampled households perceived change in the climate. This implied that smallholder farmers were aware of the changing climate". (...) The findings indicated that smallholder farmers in Western Kenya understood the effects of climate change.
11	Climate change vulnerability, adaptation measures, and risk perceptions at households level in Acholi sub-region, Northern Uganda	Twecan, D.; Wang, W.; Xu, J.; Mohmmed, A.	Land Use Policy	2022	10.1016/j.landusepol.2022.106011	"The majority of respondents in the study area believed to have experienced climate change. Study participants reported changes in temperature and rainfall, higher temperatures, short rainy seasons and below normal rainfalls, increased pests and diseases, increased frequency and intensity of extreme weather events. (...) Across the six districts surveyed, extreme temperature, droughts, change in market prices, crop pests, diseases and weeds, and animal parasites and diseases were perceived by young farmers as the leading threatening indicators associated with climate change. (...) Farmers' ability to identify climatic risk indicates the importance of climate-related conditions for farm-level activities. Perceptions of farmers to risks are mostly determined by changes in environmental conditions, geographical location, and individual socioeconomic status. (...) This section looks at farm households' perceptions regarding weather-related risks, production risks, and young smallholder farmers' concerns from changes in climate in Acholi subregion. The results have shown that over 90% of young farmers perceived changes in rainfall patterns, droughts, and increased temperature. The perception of changing rainfall patterns was stronger than the rest. Concerning the perceived change in rainfall patterns, it is evident that an overwhelming majority of young farmers perceive this change since farming in northern Uganda is predominantly rainfed, and farmers had vivid observations regarding the changes in timing and intensity of the rainfall. (....) Over 82% of study participants reported extreme weather, lack of agricultural extension service, and limited access to agricultural inputs as the primary agriculture production risks at household level. Furthermore, crop pests and diseases were among other factors significantly affecting agriculture production. In Amuru, Nwoya, and Kitgum districts, young farmers perceived land grab through eviction of extremely vulnerable rural people from their ancestral land by state-orchestrated agents (influential individuals such as the army, politicians, and elites) who are corrupt, untrustworthy, and with hidden interests (Mabikke, 2011) were among other severe threats to agricultural production and security. Respondents were also interviewed on their concerns about climate change-related risks and their impacts at household farm level. In all the six districts, young farmers perceived that extreme weather, droughts, increased temperature, and changing rainfall patterns were due to climate change and regarded as the greatest threats to agriculture production. Over 90% of young farmers interviewed responded that climate change would significantly amplify the destruction of native tree species as smallholder farmers resort to charcoal burning as an alternative source of livelihoods, increased threats to agriculture, and increased food and income insecurity in the region. Climate change would trigger rural-urban migration and increase land grabbing in the region due to its fertility".
6	Extreme hydroclimatic events in rural communities of the Brazilian Amazon: local perceptions of change, impacts, and adaptation	Almudi, T.; Sinclair, A.J.	Regional Environmental Change	2022	10.1007/s10113-021-01857-0	"Extreme floods were by far the extreme hydroclimatic event mentioned most often by interviewees. The extreme floods occurring from 2009 on were often cited by participants, and their identification of these events agreed with the physical data reported above. Changes noted included that high floods are reaching even higher levels, occurring at a greater speed from the onset, taking longer to recede, becoming more recurrent, and ending in overall higher water levels (i.e., high water levels during the ebb phase). These themes crossed all the sectors that we interviewed, with a widespread agreement in the data. There was also agreement among participants that the last four floods at the time of data collection, from 2012 to 2015, were extreme floods. (...) Interviewees in phase one also widely cited 2005 and 2010 as extreme hydrological droughts, also corroborating the physical data and literature. Participants of phase two corroborated the results of phase one and added that 2015 was also a severe drought. Participants in both research phases also mentioned that storms (i.e., heavy rain with strong winds) are becoming more common and more intense. The second most mentioned change in phase one was that summers are gradually becoming "stronger." In other words, the seasons have been presenting a combination of lack of rain and high temperatures beyond what participants perceived as average. Several participants mentioned 2015 as one of the strongest summers they experienced in the last decades. Participants also mentioned the unusual number of accidental fires happening in 2015, corroborating the Civil Defense reporting. Participants in phase two supported these views, and most mentioned that the climate has been changing toward stronger summers more noticeably in the last 10 to 20 years. "I remember that ten years ago the sun was not this hot, we would work until 11:00 a.m. and then go back to work at 1:00 p.m. We were used to that. Now, when it is 3:00 p.m. we still cannot get out of the house" (Josivan). Participants also noted that summers used to be windier which, together with the decrease in shade area due to deforestation, there is an increase in the "feels-like" temperature. Participants in both phases commonly mentioned that climatic events are becoming more variable, with a higher range of intensity within shorter timeframes: "the river is unpredictable. We observe, we live here the whole life by the river, but you don't have an experience that works…" (José Rubens). The timing of rainy and dry seasons, rising and receding river levels, were presented as being harder to predict in the last years: "No one can predict how the next flood will be anymore" (Edmilson). There was no exact point in time which participants identified as being a turning point, but in general, they agreed that they already started to notice changes in the second half of the 1990s, intensified during the 2000s and reached their peak more recently. Ribeirinhos elsewhere have also widely reported their perception of lower hydroclimatic predictability (Pinho et al. 2015; Oviedo et al. 2016). (...) The data demonstrate that the perception of impacts reflected the vulnerability of communities to hydroclimatic changes, but this depended mostly on their geographic location and sources of livelihood. Geographic location determined the exposure to changes, with communities located in uplands suffering the most with the occurrence of strong summers and the least with hydrological droughts. Communities located by the main river stem did not suffer impacts of hydrological droughts as much as those located on the margins of lakes and river arms. Communities and households located on lower floodplain areas were the most exposed to extreme floods but also were more prepared to handle these events. Differential impacts were also determined by livelihood sources. As most participants relied on crop agriculture, extreme flooding and stronger summers were seen as important hazards. Those that relied mostly on fisheries were more concerned about the impacts of extreme hydrological droughts, while they felt that extreme floods actually brought positive impacts.

6	Climate change perceptions, impacts and adaptation practices of fishers in southeast Bangladesh coast	Alam, E.; Mallick, B.	International Journal of Climate Change Strategies and Management	2022	10.1108/IJCCSM-02-2021-0019	"All the fishers who participated in the survey have personal beliefs and knowledge that climate change is occurring. Data obtained through individual interviews and FGDs confirmed that the fishers' community perceived the change in temperature, rainfall, seasonality, tropical cyclone, inundation pattern and the type and sea-level changes. The fishers observed temperature changes as increased warm days and night, heatwave and decrease of cold days/night. The fishers described a decreased trend in total annual rainfall, rainy days and high rainfall for a short period. The fisher described their observed changes in seasonality patterns in many ways, of which the most common changes experienced include longer and hotter summer than before and late-onset of the monsoon season. Changes in tropical cyclones were described by an increase in intensity and frequency of tropical cyclones and the height of tropical cyclone induced storm surges. In total, 22.8% of respondents could not relate their understanding between climate change and tropical cyclones. The fishers, particularly those from the Sarikait of Sandwip Island, experienced salinity intrusion and more area being inundated during high tide. The fisher community provided mixed responses concerning sea-level change, including increasing and decreasing, and no change. The fishers living adjacent to the coast in Sandwip experienced sea level rise because of erosion-induced advancement of sea level and intrusion of tidewater due to the embankment breach. Data obtained through FGDs in both study sites confirmed that the respondents were less likely to perceive it as a manifestation of rising sea levels due to global warming. The fisher from the Salimpur coast opined that they observed that the sea levels decreased. (...) In response to a question regarding the effects of summer temperature rises, decreased seasonal rainfall and late-onset of the rainy season, most fishers opined the decrease in fish in the Bay of Bengal. (...) The other problems opined by the fisher communities are also directly related to their life and livelihood strategies, such as increased heatwaves causing sickness, decreased fish in large areas and decreased some popular fish species."
6	Indigenous local observations and experiences can give useful indicators of climate change in data-deficient regions	Chanza, N.; Musakwa, W.	Journal of Environmental Studies and Sciences	2022	10.1007/s13412-022-00757-x	"There is a wide collection of elements of the climate system that are used as indicators of climate change in Mbire. These include temperature, rainfall, mist, storms, and wind. Atmospheric system: "With reference to temperature, participants revealed that the winter season (May/June/July) is becoming cooler than before. The participants recalled that long back they could not distinguish the winter season as it used to be hot throughout the year. However, there were mixed views about the general perceptions in temperature changes during other times of the year. Some indicated that they had not experienced any significant changes in temperature, while others felt that it was becoming hotter particularly during the months of September/October/November/December. Those who perceived a hotter environment indicated that they were able to tell this from observing birds dying of high temperatures, a phenomenon that they could not experience about 20 years ago. Another line of argument linked the death of birds in summer to the lack of water during this period. Changes in rainfall characteristics featured prominently during group interviews. Rainfall is reported to have changed in reliability, quantity, duration, and direction of origin. The evidence emerging from the narratives of the participants is that rainfall patterns have largely been distorted. The participants described that their traditional effective rains would consistently come from the northern direction, but have become rare. Of late, the rains are increasingly becoming short-lived, patchy, and originating from any direction. The villagers also used to give distinctive names based on the time and quantity of the rains that they would receive throughout the rainfall season. They narrated that the summer seasonal calendar used to be well marked with identifiable and observable rainfall patterns that were captured in local names. Of late, however, such rains are poorly defined and very unpredictable. The distinctive rainfall calendar would assist them to plan for the agricultural season and make appropriate farming decisions. Of late, the increasing unpredictability and unreliability of rains have forced them to abandon the practice of identifying rainfall by names. The rainfall season is also understood to have significantly shrunk as measured by the late start of the rains and the early termination of the rainfall season. The traditional rainfall onset dates are reported to have shifted from mid-October to December, with early cessation of the rains about a month earlier in February/March, instead of April. Apart from the rainfall season becoming shorter, it is also noticeably and commonly becoming drier as a result of shorter rainy seasons. Drought is becoming a common feature every agricultural season, and the season is reportedly being punctuated by increased number and length of dry spells. They now experience more drier days in the months of January/February. The participants were able to associate this increased dryness with the wilting of their crops around this period. Effective rains that would signal the onset of the proper farming season were said to be a rarity. These rains would be experienced around mid-October or early November, if the rains are delayed. According to the interviewees, if these rains are received, they are now coming lately around mid-December. The participants added that if significant rain downpours are received in December/January, the rain would usually be violent. (...) For participants in Chitsungo, the mist that used to cover Mushongavende Mountain, a stretch of the Zambezi escarpment, is now rarely witnessed. The mist used to be an indicator of imminent rains. The participants recalled that the changes in rainfall became evident since 2002. Physical system: "There was a common observation by the participants that most of the rivers that used to be perennial have become either seasonal or ephemeral. (...) The participants attributed the increased frequency and severity of riverine flooding to the combined effects of river channel disturbance and heavy storms. Deep pools like the sacred Mushongavende found in Hunyani River have become smaller and shallower. Other pools such as Nyamoto and Nyamvuu that used to keep hippopotamuses and crocodiles are now drying up in August/September before the onset of the next rainfall season. The interviewees also revealed that there has been increased desiccation of makambwe (pans) as evidenced by the reduced time they keep water. Some of these pans that used to keep water throughout the year are said to be drying up early in May/June. (...) Participants unanimously attributed the increased degradation of river courses to the activities by both humans and animals as they adapt to a drier climate". Biosphere system: "A number of indicators of climate change are quite evident in changes in abundance and behaviour of wild animals and birds, changes in the phenology of plant species, changes in fish species, and the decline in bees. The drying up of water bodies seems to be coinciding with the disappearance of hippopotamuses and decline in crocodile numbers. However, the latter were reported to be increasingly attacking livestock. The participants also indicated increased incidences of crop raids by elephants, baboons, monkeys, and wild pigs, thereby exacerbating human wildlife conflict. (...) Participants' narrations pointed towards a surge in incidences of diseases that affect humans, crops, and livestock, including increases in new insects and pests. Although they mentioned an increase in malaria as a result of warmer temperatures and other diarrheal diseases to be affecting the people more, the interviewees stated that there are some unknown ailments that were not experienced before. The participants related the surge in these diseases to water shortages. They also associated the pests and diseases with drought and the general change in ecological conditions. (...) Migratory stock birds such as the once popular shuramurove, whose appearance was interpreted by the villagers to mark the onset of the rainy season, are now rarely found. The interviewees indicated that such birds used to be found every year in October/November. They also reported about common incidences of birds coming to courtyards to look for water particularly during the dry season when most ground water sources would have dried up. Honey harvesters used to come across the honey bird (tsoro) whose sounds and movement were decoded by locals to track the location of bee hives. However, the interviewees indicated that it was becoming rare to come across such birds and the bee hives. (...) Participants also revealed that they keenly observed changes in plants, particularly fruit trees that they rely on as supplementary food sources". Social system: "There were reported adjustments in the villagers' livelihoods and way of life, which are indicative of the need to suit the new changes in their local environment. The locals have changed their farming practices largely because of drought and animal raids on crops. The dual season cropping that they used to practise is no longer supported by a drier climate. (...) The frequency of watering gardens was reported to have increased during the dry season. People now have to travel longer distances to access water. Given the long distances travelled to get to the gardens and get water for domestic use, there are instances where the villagers worry about girls' safety".
6	Risk, perception and adaptation to climate change: evidence from arid region, India	Singh, N.P.; Anand, B.; Srivastava, S. K.; Kumar, N.R.; Sharma, S.; Bal, S.K.; Rao, K.V.; Prabhakar, M.	Natural Hazards	2022	10.1007/s11069-022-05216-y	"From the conducted survey, it was found that majority of the farmers agreed variation in the distribution of rainfall with greater uncertainty over the onset and withdrawal of monsoon. They opined that the duration of rainy days has reduced over the past years, with more intense rainfall over shorter period within the growing season. About 86 per cent of the farmers perceived increase in the atmospheric temperature, leading to higher incidence of extreme temperature during summers. A significant increase in the frequency of heat waves was reported by 63 per cent of the respondents. Water stress was expressed by about 44 per cent of the farmers due to occurrence of intra-seasonal dry spells or drought-like situations in the region. (...) Fifty-nine per cent of the farmers in the selected villages expressed that changing climate is driving spread of pest and diseases. Rising salinity and declining soil fertility were also perceived by many. Majority of the farmers opined that in the recent times both underground and surface water resources are adversely impacted and are emerging issues in the region. Further, farmers also expressed that unpredictable weather perils have escalated the cost of agri-inputs, causing uncertainty in agricultural investment decision. Moreover, farmers agreed that climatic shocks accentuate the possibility of production risk, which results into loss of income and impacts their livelihood. They also opined that production failure impacts employment opportunities in farming (38 per cent). A large proportion of the farmers unanimously expressed deterioration in the quality of common property resources (ponds, wells, etc.) in their villages. About 30 per cent of the farmers agreed that uncertainty led by climatic aberrations has forced them to curtail their consumption expenditures.

6	Role of Homestead Forests in Adaptation to Climate Change: A Study on Households' Perceptions and Relevant Factors in Bandarban Hill District, Bangladesh	Baul, T.K.; Peuly, T.A.; Nandi, R.; Kar, S.; Karmakar, S.	Environmental Management	2022	10.1007/s00267-022-01598-8	"The homestead survey results showed that homestead forest owners in the mid-hill were more aware of climate change compared to the other two hills. In general, 76–94% of forest owners across three ranges perceived that temperature and erratic rainfall pattern has increased compared to the past 30 years. A total of 46% of owners perceived that the annual amount of rainfall has increased, with the respondents from the low hill being significantly highest. With regard to the impacts on physical conditions, in general, 82–94% of owners, with no significant differences among the hill ranges found an increase in the landslide and drying up of seasonal streams in the last 30 years. Around half and a large majority of the forest owners´ perceptions were towards decreasing flood intensity and soil moisture, respectively. Regarding ranges, the forest owners´ perceptions in low hill toward increasing flood intensity was significantly higher than those in relatively high hill, who (55–68%) contrarily, commented on decreasing trend of the flood. In case of the impacts on biotic conditions, most of the owners perceived that jhum crop cultivation intensity decreased compared to the past. The majority of the owners commented on decreasing crop production as they perceived an increasing infestation of pests and diseases, with the people in low and high hills being significantly higher than those in mid-hill. On average, 82% of the forest owners believed that change in phenology of trees took place compared to the past 30 years, for example, change in falling and arrival of leaf and flowering in trees".
12	Living and Responding to Climatic Stresses: Perspectives from Smallholder Farmers in Hanang' District, Tanzania	Maliki, M.A.; Pauline, N.M.	Environmental Management	2022	10.1007/s00267-021-01588-2	"95% of respondents from Dawar reported recurring drought incidences, flood incidences (97.5%) and landslide incidences (92.5%). Drought incidences were also highly reported in Gocho (92.5%) and flood cases were reported by half (50%) in the village. Generally, it was agreed by the majority of the focus group discussants that climate extremes pose significant impacts on crop production and livestock keeping in their villages. Recurring periods of famine and outbreaks of crop pests and animal diseases were reported as impacts of climate stresses in the villages. (...) drought was reported by the majority of farmers in both villages for the years between 1999 and 2000. During FGD in both villages, the participants affirmed occurrences of climate stresses, mostly reported in Dawar rather than Gocho village. (...) Occurrence of floods and landslides events were reported to have increased in Dawar in the years 1998 (El Nino) and 2018. However, six incidences of floods and landslides were reported in Gocho and mainly occurred during the following years: 1984, 1988, 1997, 1998, 2014 and 2018. (...) Results indicated that the climate is changing and farmers pointed out indicators of the change based on climatic variables, and agricultural practices and productivity. Farmers revealed a significant increase in drought incidences ($p = 0.0001$) in their area as affirmed by 85 and 93% from Dawar and Gocho villages, respectively. Substantial temperature increases ($p = 0.004$) and food shortages ($p = 0.001$) were reported in the study villages. They were mostly reported by 95% of respondents from both villages. (...) Rainfall intensity was reported to decrease significantly ($p < 0.05$) over the years as asserted by 85% of respondents in Dawar and 70% for Gocho village. Increasing water stress ($p < 0.05$) was reported by 68% of respondents from both villages, while crop pests and diseases were found to increase ($p = 0.0001$) as reported in Dawar (78%) and Gocho (85%). (...) Changing in planting seasons was frequently used as a climate change indicator ($p < 0.05$) reported in Dawar by 70% of respondents, and variability of weather appeared to increase ($p = 0.007$) as experienced by 85 and 80% of farmers from Dawar and Gocho villages, respectively. The occurrence of animal diseases ($p < 0.05$) was revealed by 88% of farmers, while 73% of farmers confirmed wind variability ($p = 0.001$) as an important indicator of climate change mostly manifested from Dawar village. However, flood occurrence in the villages was generally not highly reported except in Dawar with 65 % of farmers mentioned to have experienced floods cases".
6	Awareness and perception of climate change by smallholder farmers in two agroecological zones of Oyo state Southwest Nigeria	Akano, O.; Modirwa, S.; Oluwasemire, K.; Oladele, O.	GeoJournal	2022	10.1007/s10708-022-10590-y	"In the savannah, all the respondents (100%) were aware of changes in rainfall pattern and intensity. Nearly all of them (95.5%) were aware of changes in temperature and 78.5% of changes in heat levels. Similarly, in the rainforest, a large proportion of the respondents (92.5%) were aware of changes in rainfall patterns and 78.5% of changes in rainfall intensity. The majority were aware of changes in temperature (87.5%) and 67.5% of changes in heat levels. (...) Moreover, in the savannah, 91.5% of the respondents were aware of increasing crop and animal pest incidence and disease occurrence and their increasing resistance to control measures (83.5%). The majority of the farmers (74.0%) in the rainforest were aware of increasing pest and disease incidence and 69.0% of resistance to control. The respondents in the savannah were more aware of this set of climate change indicators. (...) In the savannah, a larger proportion were aware of crop failures (93.0%), reduced crop yields (90.0%), less fertile soils (98%) and reduced organic matter in soils (89.0%). In the rainforest, 79.5% were aware of frequent crop failures, reduction in crop yields (80.5%), low soil fertility (81.5%), and loss of soil organic matter (76.5%). (...) In the savannah, the majority of the farmers (87.0%) viewed the prolonged dry season as an effect of climate change, 42.5% attested to extended periods of the wet season, and 56.0% were aware of a decline in the Harmattan season and warmer Harmattan season (46.0%). Similarly, among the respondents in the rainforest, 70.0% were aware of a prolonged dry season, 39.0% of a prolonged wet season, 51.0% of a reduced Harmattan season and 56.5% of a less dry/cold Harmattan season. (...) Most respondents in the savannah (76.5%) were aware of wetlands (fadama/akuro) getting drier than usual, 93.0% of shortages in groundwater and river banks reducing by the day (72.0%). More (54.0%) of the farmers in the rainforest were aware of drier wetlands, groundwater shortages (69.5%) and receding rivers (62.5%). (...) The respondents in the savannah were highly aware of the occurrence of torrential rainfall (74.5%), flooding (81.0%) and excessive run-off after downpours (91.0%) as signs of climate change. However, in the rainforest, 57.0% were aware of torrential rainfall occurrence, few (30.5%) flooding, and excessive runoff (39.0%). (...) Approximately half (53.0%) of the farmers in the savannah were aware of increasing scenarios of strong winds carrying dust particles, drought (75.5%), and desertification (85.5%). In the rainforest, 54.0% were aware of increasing strong winds, 49.5% of drought and 36.0% of desertification. (...) In the savannah, none of the respondents had a very low awareness level of all climate change indicators. Very few respondents (0.5%) had a low to medium awareness of climate change, while 38.0% had a medium to high awareness. Furthermore, 61.5% of the respondents had a very high awareness of climate change. However, in the rainforest, few respondents (7.5%) had a very low awareness level, 18.0% had a low to medium awareness, 41.5% had a medium to high awareness and 33.0% had a very high awareness of the indicators of climate change. The respondents in the savannah were more aware of climate change indicators than their counterparts in the rainforest. (...) In the savannah, all the respondents (100.0%) favoured the perception that changes in rainfall pattern and intensity were due to climate change. A large proportion of the farmers (73.5%) had highly perceived that changes in temperature and heat levels (74.5%) were the results of a changing climate. However, in the rainforest, 73.5% of them perceived changes in rainfall pattern, changes in rainfall intensity (62.5%), changes in temperature (72.0%) and changes in heat levels (53.5%) were the consequences of climate change. (...) In the savannah, 89.0% had a favourable perception of increasing pest occurrence and disease incidence, and 82.0% perceived increasing resistance to control measures. Moreover, 72.5% of the respondents in the rainforest perceived the increasing pest occurrence and disease incidence, and their resistance to control measures (62.0%) was a result of climate change. (...) A large proportion of the respondents (95.0%) in the savannah favourably perceived climate change as crop failure, a reduction in crop yields (91.5%), less fertile soils (97.5%) and loss of soil organic matter (89.0%). In the rainforest, 71.0% had a favourable perception of crop failure, a reduction in crop yields (70.0%), soil fertility loss (67.5%) and loss of soil organic matter (61.5%). (...) The respondents in the savannah perceived a prolonged dry season (85.5%), a prolonged rainy season (47.0%), a reduced Harmattan season (57.0%) and a warmer Harmattan season (45.0%) as indicators of climate change. In the rainforest, 52.0% had a favourable perception of a prolonged dry season, a prolonged rainy season (35.5%), a reduced Harmattan season (39.0%) and a warmer Harmattan season (40.0%). (...) In the savannah, 73.0% had a favourable perception of drier wetlands, shortages in groundwater (89.0%), and receding rivers (66.5%). In the rainforest, 52.0% favourably perceived drier wetlands, groundwater shortages (53.5%) and receding rivers (58.5%) as being caused by climate change. (...) Torrential rainfall (65.0%), flooding (76.0%) and excessive run-off (91.5%) were considered the effects of climate change by farmers in the savannah. On the other hand, 47.0% of those in the rainforest had a favourable perception of torrential rainfall, flooding (30.0%) and excessive run-off (31.5%). (...) Approximately half of the respondents in the savannah (50.5%) attest to the increase in strong winds carrying dust particles, drought (73.5%) and desertification (82.0%) to be a result of climate change. In the rainforest, 43.5% perceived an increase in strong winds, drought (44.5%) and desertification (28.0%). (...) In the savannah, none of the respondents had a low level of favourable perception of the indicators of climate change. Very few respondents (1.0%) had a low to medium perception, 35.5% had a medium to high perception and 63.5% had a very high and favourable perception. In the rainforest, none of the respondents had a very low perception level. However, 10.5% of the respondents had a low to medium perception, 55.5% had a medium to high favourable perception and 34.0% had a very high and favourable perception of the indicators of climate change. More farmers in the savannah had a favourable perception of climate change indicators than those in the rainforest".
6	Community perceptions of climate change and ecosystem-based adaptation in the mangrove ecosystem of the Rufiji Delta, Tanzania	Nyangoko, B.P.; Berg, H.; Mangora, M.M.; Shalli, M.S.; Gullström, M.	Climate and Development	2022	10.1080/17565529.2021.2022449	"There were significant differences in the responses from respondents with different occupations in relation to the perceived extent of change in temperature, amount of rainfall and sea level rise. Farmers and fishermen indicated that they had observed stronger change in many climate variables compared to other occupational groups". (...) Respondents were asked to indicate if they had noticed any unusual changes in climatic conditions, and the extent of observed climate change and variability as perceived by occupation in the study area during the last 10 years is presented in Table 1".

6	The Relationship between Climate Change, Variability, and Food Security: Understanding the Impacts and Building Resilient Food Systems in West Pokot County, Kenya	Obwocha, E.B.; Ramisch, J.J.; Duguma, L.; Orero, L.	Sustainability (Switzerland)	2022	10.3390/su14020765	"Delayed onset and early cessation of rainfall and increased temperatures were variables more recognized by respondents than the total rainfall amount in a season. [...] Respondents agreed most about an apparent decrease in the amount of rainfall. (...) The respondents reported changed rainfall and temperature variables when discussing food security. More respondents in the lower potential lowlands (Kacheliba) reported that they were "greatly affected" by climate changes (75%) while only 14% of the respondents in the high potential highlands (Kapenguria) said food production was "greatly affected". Barely any respondents (3%) noted no effect of climate change, but Kapenguria respondents were the most likely (84%) to report that food production was "slightly affected". (...) In general, more respondents (44%) reported crop growing seasons were shorter than before, 38% reported no change, and 6% indicated that it varied year to year depending on rainfall distribution. Important regional variations can be noted though. While highland (Kapenguria) respondents were more likely to report observing "no change" (55%) than "shorter seasons" (33%), midland (Chepararia) respondents reported "shorter seasons" (46%) more often than "no change" (39%). The lowlands were most affected as compared to the other agroecological zones. In Kacheliba, 57% of respondents reported "shorter seasons" while 25% said it "varied year to year depending on rainfall distribution". A handful of Kacheliba respondents (3%) even reported "longer growing seasons", although this was likely due to their reliance on irrigation from the River Suam for their crop production. (...) The majority of respondents (65%) reported a decline in crop yields. Nearly all (97%) respondents in lowland Kacheliba reported a decline, supported by a majority of midland Chepareria respondents (61%), and almost half (49%) of Kapenguria respondents. In the highland and midland, respondents (24% and 27%, respectively) reported steady yields, and 16% of the respondents said crop yields had increased".
6	Climate change perceptions and adaptations by indigenous Chepang community of Dhading, Nepal	Rai, S.; Dahal, B.; Anup, K.C.	GeoJournal	2022	10.1007/s10708-022-10577-9	"Climate change parameters: temperature, rainfall, and wind pattern were chosen to analyze people's perceptions. Most of the respondents (84.12%) felt the increase in temperature and the number of hot days. About 74% of the respondents claimed that premonsoon season days were extremely hot, and no measures were applied to cope with the rising temperature. Most people expressed that winter was becoming quite cold and frosty, especially in the morning, affecting old-aged people and children (61.35%). They were heating their house by burning firewood and protecting their body by wearing warm clothes to save from the cold. They have perceived a decrease in pre-monsoon rainfall and increased extreme rainfall events due to the changing climate (97.3%). Also, most of them have observed the late start of the monsoon season (76.49%) and occasional extreme rainfall events in the post monsoon season (October and November). This had affected their water source, agricultural production, income, and food security in the village. During the field visit, no other water source was seen except an individual tap from a nearby spring and Gomati river. Talking about the wind patterns, the wind speed has been perceived to be increased (87.91%). There were blowing up house roofs and animal sheds a few years back due to strong winds. (...) Most of the respondents have pointed to drought (95.94%) as the main effect. A forest fire has affected 69.13% of the respondents, followed by soil erosion (62.89%), small landslide (55.3%), and landslides of more significant impacts (33.47%). The soil fertility has decreased, causing low productivity and vanishing crops like maize, beans, fruits, and vegetables".
2	Factors Influencing Choice of Climate Change Adaptation Methods among Underutilized Indigenous Vegetable farmers	Ekemini-Richard, M.; Ayanwale, A.B.; Adelegan, O.J.	International Journal of Vegetable Science	2022	10.1080/19315260.2020.1848960	"Almost all respondents were aware that the climate is changing. (...) A smaller group perceived that Underutilized Indigenous Vegetable (UIVs) can be used as an adaptation method against the effects of climate change. Personal observation and newspapers served as main sources of information about climate change. (...) Being more educated increase farmer awareness about the incidence and consequences of climate change on crop productivity adaption strategies to reduce adverse effects of climate change". (...) Abstract: Although most (>90%) respondents perceive and are aware of, climate change, fewer (76%) are aware of the expediency of cultivation of UIVs as an adaptation to climate change".
6	Farmers' behaviors and attitudes toward climate change adaptation: evidence from Vietnamese smallholder farmers	Tiet, T.; To-The, N.; Nguyen-Anh, T.	Environment Development and Sustainability	2022	10.1007/s10668-021-02030-7	"Our first five explanatory variables bear the concerns, beliefs, perceived risks, ingenuity of the respondents regarding actual climate change impacts, and trust in the institution for retrieving the respondents' support for adaptation and climatic mitigation change. Our results are all consistent with all our initial hypotheses from concern (1), belief (2), ingenuity (3), and perceived risk (4). (...) farmers' perceptions of climate change risk positively support the selection of their adaptation and mitigation measures. Our result indicates that since the farmers perceive risks caused by climate change impacts, the log odds of selecting adaptations and mitigation grow by 0.3337. (...) Our result suggests that farmers' beliefs in climate change occurrences and consequences as well as their risk perceptions could positively impact their adaptation and mitigation behaviors, while trust in institutions does not significantly influence farmers' behaviors toward climate change adaptation and mitigation. Meanwhile, human ingenuity has a negative and significant impact on farmers' decisions in taking climate change adaptation and mitigation actions. Therefore, our results support the VBN theory that individual beliefs, awareness and risk perception are important factors that could strengthen individuals' pro-environmental behaviors. (...) Moreover, we found that perceived risks caused by extreme weather events positively impact farmers' supports for adaptation and mitigation".
6	Development of a regional climate change perception index based on traditional knowledge base of small-marginal farmers	Bhattacharjee, S; Das, JK; Roy, S; Chakrabarti, S	Indian Journal of Traditional Knowledge	2022		"The impacts of climate change are well observable in the environment with significant variations in the pattern of climate events like floods, droughts etc. (...) In real-life situations, the practicing small-marginal farmers are aware of many environmental phenomena already, however, they might not be rightly channelizing that knowledge for crop improvement. Through key informants, it was clear that many small-marginal farmers in the community observed (1) changes in the flowering and fruiting habits of their crop, (2) new weeds popping up in their fields, (3) changes in the pest population in rice field etc. Moreover, they are relating it to rise in temperature over years and changes in their crop production. (...) In our case, while assessing the climate change perception of the farmers, the existing knowledge base of the farmers on the phenomenon of climate change may act as both a driver as well as a barrier. While talking to the key informants, it was found that majority farming households claim that they are aware of the terminology 'climate change', however, they do not have clear idea about its impacts. Some of them also claim that climate change has religious significance etc. (...) Social, economic & policy related: These statements are related to climate change perceptions of farmers relating to the society, monetary incentives and the government. These perceptions are crucial for a farmers' well-being and ensure social and financial security in the community. (...) The results from judge's rating show that 21 perception statements out of 62 are relevant for the climate change perception index with a mean relevancy score 3.5 and above. Ten Agricultural and Environmental, five Social, economic and policy and four personal beliefs of the small-marginal farmers statements have a mean relevancy score of 3.5 and above. The most relevant perception statement is a social, economic, & policyrelated statement (S14- Income from agriculture is adversely affected due to climate change). S1= Climate change affects small and marginal farmers more; S2 = Change in length of season – short winter and long summer etc.; S3 = Phenomena of irregular and erratic rainfall has increase; S4 = Changes in intensity and frequency of storm, cyclone etc.; S5 = There is an effect of CO2 on climate change; S6 = Zero tillage, mulching, SRI are good for climate resilient agriculture; S7 = Climate change is affecting farming in a negative way; S8 = Climate change impacted food production of my farm; S9 =Climate change affected incidence of pests and diseases; S10 = I have noticed any long-term changes in the mean rainfall over the past 15 years; S11 = I have noticed any long-term changes in the mean temperature over the past 15 years; S12 = Farmers have much bigger challenges to deal with the climate change; S13 = There is decrease in the crop yield due to climate change; S14 = Income from agriculture is adversely affected due to climate change; S15 = Water resources are decreasing day by day due to climate change; S16 = I am worried about the indiscriminate destruction of indigenous plants and animals; S17 = Fisher folks in Sundarbans should deploy sustainable practices for better environment; S18 = It is the Government's responsibility to maintain and preserve the ecological balance in the Sundarbans; S19 = Increase in sea level and reduction in fresh water availability; S20 = There will be decline in number of fish species; S21= Lower availability of fresh water for drinking due to increase in sea water. (...) From the study it is found that in Terai zone, among 50 farmers, 40 farmers (80%) have high perception (61-105) on climate change and the rest 10 farmers (20%) are with low perception (21-60) on climate change. In Red-lateritic zone, out of 50 farmers, 46 farmers (92%) are with high perception (61-105) and only 4 farmers (8%) have low perception (21-60) about climate change. Again, in case of Coastal and saline zone, among 50 farmers 39 farmers (78%) have high perception (61-105) and 11 farmers (22%) have low perception (21-60) on climate change Majority farmers in these regions have high perception on climate change, which is a driver for the policymakers to introduce climate-resilient agricultural practices and facilitate climate education to ensure sustainable development in agricultural practices.
1	Determinants of Farmers' Risk Perceptions of Hailstorms in Northern Bangladesh: Is Adaptive Capacity the Major Concern?	Raihan, M.L.; Basu, M.; Onitsuka, K.; Hoshino, S.	Polish Journal of Environmental Studies	2022	10.15244/pjoes/135699	"In all, 94% of the farmers perceived a high probability of occurrence (exposure) of hailstorms and almost 95% perceived a high impact (sensitivity) of hailstorms on agricultural and crop production. (...) The findings on farmers' hailstorm risk perceptions indicated that, of the 64% of total respondents who perceived hailstorm risk, about 98% had perceived the risk, whereas 2% were unsure of the extent to which they had perceived the risk. On the other hand, of the 90% of farmer respondents with a highly perceived hailstorm risk, 2% perceived hailstorms as being less of a risk. Moreover, 6% of farmers had a moderately perceived hailstorm risk to their crop production and agricultural activities".

19	Climate change perception and local adaptation of natural resource management in a farming community of Cameroon: A case study	Chimi, P.M.; Mala, W.A.; Fobane, J.L.; Essouma, F.M.; II, J.A.M.; Funwi, F.P.; Bell, J.M.	Environmental Challenges	2022	10.1016/j.envc.2022.100539	"The most recurrent opinions are: "The climate is not like the climate of the past. Nowadays, we cannot explain the different seasons with precision, or even locate them in time and space. (...) The local populations are almost unanimous about the existence of climate variability, i.e. about 95% of the sample. These variabilities are perceived by poor temporal distribution of dry and rainy seasons, an increase in temperatures, an increase in the frequency of winds, and an appearance of invasive species (locusts, caterpillars) in crops. The respondents mention that these variabilities are the cause of the defor- estation of the few forest galleries in the study area in 49.3% of cases, the non-respect of social norms promoted by traditional beliefs in 25%, and punishment due to disobedience of deities in 25.7% of cases. Similarly, the surveys show that the agricultural sector, with its calendar, is one of the elements most affected by climate change due to the rise in tem- peratures, the increased variability of the rainy and dry seasons, as well as the increase in violent winds. As a result, 58.4% of the respondents claim that climate change is manifesting itself in their locality through longer or shorter dry seasons, while 23.3% believe that the intensity and recurrence of strong winds are more pronounced. The change in temperature during the dry and rainy seasons is very noticeable to the majority of local people. According to the respondents, during the last ten years, 83.3% think that temperatures have been high in the dry season and 77.3% medium in the rainy season. (...) Respondents (71.7%) believe that the change in the highest fre- quency of winds has been observed in the last ten years. The signs that precede the arrival of strong winds include a change in the color of the clouds from white to pinkish-red and the panic of animals, especially birds. According to the farmers, these winds cause significant damage: the destruction of fields and tearing offthe roofs of houses. There is no doubt that in the locality the change in the distribution of rainfall is manifest in the last ten years, i.e. 56.1%. As one of the respon- dents said: "The rains fall either before or after the period when they are supposed to fall. Currently, these disturbances are very recurrent. The delay in the rains or the small dews (Onguéméin the local language) in August 2015 led to the yellowing of cocoa cherries and a delay in the August yam harvest. If the rains, expected in a specific month, do not come, the disruption caused has repercussions on the other months. "The time of the first rains seems to have shifted from early May-June to early March," said one respondent. The respondents (69.8%) are almost unanimous about the decrease in the amount of rainfall. This decrease is perceived by the change in the amount of rainfall over the last ten (10) years. 75.9% of the female respondent believe that the change in the amount of rainfall over the last ten (10) years is high. According to one of the respondents, "It rains heavily one year and not the same amount in another. It should be noted that when it does not rain in September, October, November, we find ourselves in January and February with heavy rains. The rainfall has decreased a lot and is not evenly distributed.Overall, for 83.3% of the respondents, regardless of gender, the change in the duration of the drought as well as in the frequency of the dry season has been felt in the locality over the last ten years. Con- cerning the change in the frequency of drought, 80.9% of respondents said that this change has been high over the last ten years and has been accompanied by bush fires that have been destroying fields since 2013, as well as the appearance and proliferation of caterpillars that devastate cocoa leaves (Table 3).
6	Climate change-induced livelihood adaptive strategies and perceptions of forest-dependent communities: The case of Inanda, KwaZulu-Natal, South Africa	Wale, E.; Nkoana, M.A.; Mkuna, E.	Trees, Forests and People	2022	10.1016/j.tfp.2022.100250	"Fig. 2 below suggests that most of the sampled households are aware that both temperature and rainfall are increasing and/or changing. The results revealed that 50% perceived an increase in precipitation while 32% perceived a decrease. Despite more respondents perceiving changes in rainfall pattern, 18% of the sampled household heads did not perceive any change".
6	Do farmers perceive climate change clearly? An analysis of meteorological data and farmers' perceptions in the sub-Himalayan West Bengal, India	Datta, P.; Behera, B.	Journal of Water and Climate Change	2022	10.2166/wcc.2022.058	"Most of the surveyed farmers (90.7%) declared a change in the local climate. There was a general agreement between the summer temperature rise and farmers' perception (Table 3). The majority of the farmers (91.7%) felt that the summer months were getting more hot in the study region. However, the winter temperature was not accurately perceived by a large number of sample farmers across the study villages. 72.3 and 2% of farmers declared a decrease and no change in winter temperature, respectively, which is contrary to the trends in meteorological data. (...) In open-ended questions, several farmers expressed their discomfort due to the scorching heat of summer, which they had not experienced before. An overwhelming percentage of the farmers reported decreased precipitation during the monsoon season, which concurs with the meteorological trends identified in this study (Table 3, Figure 4). (...) Also, respondents stated that the soil of their agricultural fields has become much drier than before, and they observed cracks forming very frequently as a result of low rainfall".
10	Climate Change Perceptions and Adaptations among Smallholder Farmers in the Mountains of Eastern Democratic Republic of Congo	Amani, R.K.; Riera, B.; Imani, G.; Batumike, R.; Zafra-Calvo, N.; Cuni-Sanchez, A.	Land	2022	10.3390/land11050628	"In general, the answers from the two ethnic group studied were in agreement with regard to both climatic changes and impacts (see Figures 2 and 3). Overall, respondents from both ethnic groups reported 12 changes in climate and seven impacts (Figures 2 and 3), with most of the changes and impacts being noticed by a larger number of Bafuliru respondents. The changes which were most often reported by both ethnic groups (>60% of the respondents) were changes in rainfall distribution (dry spells, showers) and interannual variability, and there being fewer foggy days and increased hailstorms (Figure 2). Most Bafuliru respondents also reported increased temperatures, a lower amount of rainfall, the late onset of the rains, less frost and more droughts (Figure 2). The impacts most often reported by both ethnic groups (>60% of the respondents) were reduced cassava yields, an increase in cassava mosaic disease (CMD), and reduced human health (Figure 3). The respondents related the reduced human health to a perceived increase in malaria prevalence (Bafuliru) or cholera (Lega). About 40% of the respondents of both ethnic groups also reported increased soil erosion and increased diseases of livestock. The Bafulriu respondents highlighted impacts on cattle (Figure 3), which the Lega did not as they do not own cattle. "
10	Farmers' Perception and Efficacy of Adaptation Decisions to Climate Change	Reddy, K.V.; Paramesh, V.; Arunachalam, V.; Das, B.; Ramasundaram, P.; Pramanik, M.; Sridhara, S.; Reddy, D.D.; Alataway, A.; Dewidar, A.Z.;	Agronomy	2022	10.3390/agronomy12051023	"About 62% of the sampled farmers perceived climate change in various meteorological indicators (Figure 3). e 3). Approximately 40% had perceived that there was a decrease in the quantity of rainfall. However, 42% had perceived a delay in monsoon onset by one day than earlier. Even 72% of farmers perceived an increase in annual temperature, and few of them (30%) stated that there is an increase in the length of the summer season, and the span of the winter season was decreased. (...) Some of the farmers (42%) reported a delay in the onset, and 40% of the farmers reported a decrease in the quantity of rainfall. However, farmers' perceptions about the amount of rainfall trend differed. This could be due to farmers' concerns about the availability of rainfall during the main crop-growing season. They do not account for the total rainfall received in their area annually. Additionally, respondents noted that crop growth is harmed by the delayed commencement and periodic dry spells. (...) Most of the farmers (72%) perceived that there is a significant increase in temperature. Farmers also perceived higher temperatures even in January and February, which were very pleasant months before, that affected the flower production in cashew and cowpea".
10	Livelihood Capitals, Income Inequality, and the Perception of Climate Change: A Case Study of Small-Scale Cattle Farmers in the Ecuadorian Andes	Torres, B.; Cayambe, J.; Paz, S.; Ayerve, K.; Heredia-R, M.; Torres, E.; Luna, M.; Toulkeridis,	Sustainability (Switzerland)	2022	10.3390/su14095028	not applicable
6	An Assessment of Farmers' Perception and Adaptive Capacity for Climate Change	Chaudhary, H.; Mishra, K.	Indian Journal of Economics and Development	2022	10.35716/IJED/21264	"An overview of Table 1 showed a classification of farmers based on the perception of changes in the rainfall and temperature depicted that change in rainfall pattern, problem in seed quality and emergence of new pests and diseases ranked the pinnacle effects that farmers' perceived due to climate change. Change in rainfall pattern with a Garret score of 78 was perceived as the most visible effect of climate change. (...) Further, it is evident from Table 1 that the farmers opined that climate change had affected the crop cycle water scarcity in surface water bodies. Climate change had affected the crop cycle and the water bodies of rivers and streams. This environmental phenomenon had also led to frequent and severe droughts. The agricultural activities that farmers perceived as a cause of climate change were presented in Table 2. Excess use of pesticides stood first among the different activities with the highest Garret score of 67. Excessive use of bore wells and diesel engines and excess use of fertilizers were ranked second and third with Garret scores of 65 and 64, respectively. Deforestation, burning of crop residue, industrialization, and improper waste management were the other minor agricultural activities that farmers listed as a cause of climate change. The perusal of Table 3 revealed that 68 per cent of respondents thought that climate change would affect their farm after ten years in the long term, while 32 per cent of respondents thought that climate change would affect them within ten years in the short term. (...) The percentage of respondents worried about climate change had increased significantly since the last survey. The glance of Table 4 indicated that a large majority of them were somewhat (65.83 per cent) worried about the rising greenhouse gas levels and 19 per cent were very worried. Around 3 per cent of the farmers were not at all worried about climate change."

6	Climate Change Perceptions, Impacts and Adaptation Strategies: Insights of Fishers in Zambezi River Basin, Zimbabwe	Muringai, R.T.; Mafongoya, P.; Lottering, R.T.	Sustainability (Switzerland)	2022	10.3390/su14063456	"The findings indicate that 83.8% of the fishers believe that temperature has increased during the past 10 years (Table 3). During the FGDs, some of the fishers in Binga District mentioned that: When it comes to the issue of temperature and rainfall, everything has changed in the past 10 years. The weather was not as bad as it is now. The temperatures are very high throughout the day, and they are few cold days even during the winter season which is different from what we used to experience in the past... (Male, Binga District). We have already started experiencing hell on earth, in the past few years, from around August to March we are experiencing extreme hot days. Now I must wake up very early in the morning to cast my fishing nets because by eight in the morning it will be hot already...(Male, Binga District). Fishers from the Kariba District also perceived that the temperatures in their area were getting warmer, as the following statements show: The temperature has drastically increased in the past 10 years, the summer season has just become too hot, and I am starting to worry about how it is going to be in the next five to ten years from now... (Male, Kariba). Some days are just becoming too hot for me. If I remember well in the past few years, we were not experiencing hot days as we are experiencing today...(Female, Kariba). The majority of the fishers (76.3%) believe that the amount of rainfall received in their respective areas has decreased during the last 10 years. Results from the FGDs also show that fishers from both districts believe that rainfall has declined and is becoming more unpredictable. Some fishers expressed that: The way it is hot these days we also expect good rains. We used to know that if we have two or three consecutive hot days then it rains but nowadays it can be hot for several days or weeks without a single drop of rain... (Female, Kariba District). We used to receive considerable amounts of rainfall usually from late October to March but now September and October are usually dry, and we receive little rainfall maybe towards the end of November. Generally, the amount of rainfall is decreasing that's why we are experiencing a lot of drought seasons (Male, Kariba District). This area is in the low veld region, and it is generally characterized by low rainfall, but in recent years our area is becoming drier and drier, rainy days have decreased and when it rains the rainfall is not enough to fill up the lake or sustain our crops . . . (Female, Binga). In addition, a key informant in Binga mentioned that: The rainfall patterns in this area are becoming more and more unpredictable as we can have long periods of little rainfall causing serious drought situations, and then sometimes we get rainfall of high intensity we usually cause flooding. However, from my personal experience, the area is becoming dry, there is a noticeable decrease in the amount of rainfall received . . . (Male, Binga). Extreme weather events are common features in the study areas. Most fishers (63.1%) indicated that in the past 10 years there has been an increase in the occurrence of droughts, with 56.9% indicating that the occurrence of floods has increased, and 37.5% perceiving that the lake water level has decreased (Table 3). A key informant and a fisher said that: The water level is always fluctuating with the low water level being very common during the winter season and the level increasing during the rainy season. In recent years, the water level is no longer reaching the higher levels it used to reach in the previous years which might be associated with low rainfall and high evaporation due to increasing temperatures . . . (Key Informant, Kariba). In the past few years, the water level is not rising as it used to during most rainy seasons. During the rainy season, the water level used to rise and cover all those small shrubs close to the banks of the lake . . . (Male, Binga). The statements in the group discussions generally corroborated with most responses from the household questionnaires, as the fishers emphasized increasing temperature, declining and unpredictable rainfall patterns, increasing occurrence of droughts, and decreasing surface water level (Table 3). However, the nuanced views on floods seen in the household interviews were not repeated in the group discussions, where fishers did not agree on an increased incidence of floods. (...) Fishers and key informants were aware of the effects of climate change on fisheries and human wellbeing."
10	Agrobiodiversity and perceived climatic change effect on family farming systems in semiarid tropics of Kenya	Njeru, E.M.; Awino, R.O.; Kirui, K.C.; Koech, K.; Jalloh, A.A.; Muthini, M.	Open Agriculture	2022	10.1515/opag-2022-0099	"Generally, the respondents acknowledged significant climate change. There were varied opinions on the perceived causes and effects of climate change. Most notably, respondents cited excessive usage of agrochemicals and deforestation as the leading causes of climate change, with fewer respondents quoting industrialization. Significant reduction in crop yields, erratic rainfall, and drought were perceived to be the main effects of climate change. Despite the higher perception of climate change, responsive strategies are relatively weak among smallholder farmers (Table 4). Only 26.7% of farm households in Embu have adopted the use of drought tolerant crops (Table 4). Though most farmers could not adequately explain the causative factors of climate change, it was generally noted that the family farming systems acknowledged the real dangers presented by climate change. A slightly higher proportion of Kitui farmers had more significant intervention measures to cope with climate change compared to the two counties (Table 4), with 60% of the respondents using drought-tolerant crops. Respondents noted the increased human-wildlife conflict as a significant effect of climate change (43.8%) with monkeys reported as key pests in Tharaka Nithi County".
6	Assessment and adaptation strategies of climate change through the prism of farmers' perception: A case study	Kamruzzaman, M.; Rahman, A.T.M.S.; Basak, A.; Alam, J.; Das, J.	International Journal of Environmental Science and Technology	2022	10.1007/s13762-022-04254-0	"Table 7 shows the farmers' perceptions about the changes in climatic variables. Farmers were asked if they had noticed any changes in the amount of annual rainfall. Their perception portrayed that most farmers (82.28%) perceived a decreasing annual rainfall trend over 30 years. On the other hand, nearly 17.72% of respondents perceived an increase in annual rainfall. (...) Another crucial fact is that, as shown in Table 8, most farmers believed the number of rainy days and consecutive annual monsoon days was rapidly decreasing. Furthermore, the majority of respondents stated that the distribution and timing of rainfall had altered over time. Similarly, perception regarding the annual temperature trend is also tabulated in Table 7 and the results portrayed that nearly 77.2% and 7.6% of respondents perceived increasing and decreasing trend in annual temperature, respectively. Contrarily, nearly 2.5% of respondents thought that the temperature remained stable over the last 30 years. (...) Furthermore, an overwhelming majority of farmers (82.3%) believed that cold days decreased during the winter season. Along with this, about 84.4% of respondents thought that the number of hot days increased in the summer season. The farmers' perceptions of seasonal changes in the climatic variable were also collected and are tabulated in Table 8. The majority of farmers, nearly 79.7%, believed that rainfall was reduced during the winter season. However, another important finding was that no farmer perceived any increase in winter rainfall. In the summer season, nearly 74.9% and 16.5% of respondents felt that the rainfall had decreased and increased, respectively. Although 6.5% of farmers thought that the rainfall remained unchanged and table, although 5.1% had no idea about the trend of summer rainfall, it remained intact. However, most farmers thought that the rainfall had significantly decreased only in the monsoon season compared to other seasons. The perception of the seasonal temperature trend is presented in Table 8. In both cases of rising and declining trends, 46.8% of farmers felt that winter temperature had increased or decreased. However, most farmers (75.9%) perceived an increase in the summer temperature during the summer season. However, 16.5% of respondents felt that summer temperature had dropped in this season. A small percentage of farmers (1.3%) reported that the summer temperature was stable, while the remaining 6.3% were unaware of any changes in the summer temperature. During the monsoon season, 81% of farmers believed the temperature of the monsoon had risen. They also stated that the monsoon season experienced a steep increase in temperature compared to other seasons. Table 9 shows the perception regarding the negative impacts of climate change. The majority of respondents (92.4%) reported that climate change has negative impacts on-farm production. Most farmers thought that the frequency of extreme events was increasing over time. In addition, most farmers believed that the effects of drought were more severe on agriculture than the flood. Again, information was collected about the amount of crop damaged due to the drought event, presented in Table 9. Most of the respondents reported that productivity was reduced by half or one-third during a drought event. However, a small percentage of farmers reported not growing their crops during a drought event, as shown in Table 9."
6	Farmers' Perception and Adaptation Strategies to Climate Change in Central Mali	Amadou, T.; Falconnier, G.N.; Mamoutou, K.; Georges, S.; Alassane, B.A.; François, A.; Michel, G.;	Weather, Climate, and Society	2022	10.1175/WCAS-D-21-0003.1	"For changes related to rainfall, farmersmentioned a decrease in rainfall, shorter growing season, delayed and early cessation of rainfall, increase in the frequency of dry spells, and an increase in the intensity of rainfall events (Table 1). With regard to temperature, increasingly hot temperature in general, during the night, and during the growing season were reported. Increasingly violent winds were also mentioned (Table 1). Most of the changes related to rainfall mentioned by farmers during the focus group discussions (Table 1) were consistent with those mentioned by the majority of individually interviewed farmers (Table 3). Majority (.50%) of individually interviewed farmers confirmed the listed changes related to rainfall, except the change ''increasingly intense rainfall'' and ''more frequent long dry spells in the middle of the growing season'' that were only mentioned by minority of farmers. Changes in temperature and wind as reported during focus group discussions were also consistent with those reported by the majority of farmers during individual interviews (Table 3)".
6	Awareness and adaptations to climate change among the rural farmers in different agro-ecological zones of Tanzania	Mkonda, M.Y.	Management of Environmental Quality: An International Journal	2022	10.1108/MEQ-10-2021-0241	"Explicitly, Table 4 indicates that older people (>68 years) were sure at 90.6% that climate variables have been varying/changing compared to 89.2% of those aged between 48 and 57 years, 88.4% of those aged between 38 and 47 years, 86.7% of those aged between 28 and 37 and 85.5% of those aged between 18 and 27 years. Further, the result in Table 4 indicates that over 85% of the farmers have noticed that climate is changing. (...) The farmers from the arid and semi-arid zones asserted that there has been high decrease in rainfall, that is, 83% and 80%, respectively, compared to those from other AEZs who (70%) mainly mentioned that rainfall has been decreasing. The same pattern was observed when 68% and 65% of the farmers from the villages of Ikoma and Chikuyu, respectively, asserted on increasing temperature. Consequently, the farming experience of the respondents significantly contributed to acquisition of climate knowledge. The results in Table 5 portray the perception of CC based on the farming experience. Those with the longest experience were good climate repository compared to those with least experiences. Considerably, many farmers expressed some observation of recent changes in the onset of rainfall and cessation. About 40% and 50% of those with experience of 20–39 and ≥ 40 years, respectively, asserted that these particular changes have been more pronounced in the recent years. Additionally, the incidences of increased droughts and floods were almost equally asserted (at 38%) by all farmers across all the groups. This was also applied to the recent alterations of temperature."

10	Perception matters: an Indigenous perspective on climate change and its effects on forest-based livelihoods in the Amazon	Bauer, T.N.; de Jong, W.; Ingram, V.	Ecology and Society	2022	10.5751/ES-12837-270117	"Table 2 summarizes household perceptions on weather anomalies. Twenty-nine of the respondents in the household survey reported having heard the term climate change; among them, six had heard the term but could not make sense of it. Forty-eight households (98%) perceived changes in the weather phenomena over the last 10–20 years. The most frequently cited changes referred to changes in temperature, mentioned by 38 (77.5%) of the respondents, followed by changes in seasonality (26 households, 53%), rainfall (26, 53%), and wind (8, 16%). Within changes in temperature, the most often cited were warming temperatures (30, 61%) and sunburns (14, 29%), while for seasonality, it was shifting seasons (26, 53%). Within changes in rainfall, most respondents perceived an increased number of rainy days (17, 35%), and wind changes of the sur were indicated. Sur or friajes are expressions used to describe the incursion of masses of cold air or cold spells coming from Antarctica that generate drastic temperature drops in their passage through Bolivia, sometimes below 15 °C in tropical regions. Usually, this phenomenon occurs during May, June, and July and causes decreased temperatures, increases in rainfall, and thunderstorms. Forty-four (90%) households reported the consequences of the changing weather patterns. Livelihood consequences of the changing weather conditions were mentioned by 44 (90%) out of 49 households. The most frequently cited consequence mentioned by 30 (61%) respondents was an increase in human diseases, followed by 17 (55%) citing increased challenges to farming, and 17 (35%) flooding, 9 (18%) mentioned that heavy rain damages the crops, 4 (8%) said bad roads impede transportation, and 1 (2%) respondent mentioned restricted access and destruction because of the heavy thunderstorm. (...) Tacana households employ 43 (38 unique) atmospheric, astronomic, zoo-, phyto-, and human indicators to predict weather phenomena. Most of the flora, fauna, or astronomic indicators refer to observations in the environment. Two indicators (placing a machete in the yard and hitting tree roots) are said to help in preventing damage from thunderstorms. All indicators are short term, with a maximum forecast of a few days. Some 42% of the interviewees questioned the current applicability of climatic indicators and reported changes in zoo-indicators and unpredictability of the weather. Most changes perceived were related to animal migration and an increase in insects and mosquitos. According to interviewees, animals had moved farther away from villages, and fewer birds sing these days. Especially a decrease in macaws was mentioned. A general decline in the diversity and population of wild fauna and flora was observed, which participants explained as being caused by environmental pressures, such as deforestation, hunting, and monoculture farming, for example, sugarcane. "
2	Farmers' perception of climate change and gender sensitive perspective for optimised irrigation in a compound surface-ground water system	Dawit, M.; Dinka, M.O.; Halefom, A.	Journal of Water and Land Development	2022	10.24425/jwld.2022.140773	"According to the results from the respondents and the report from the agricultural sector, about 47% of households are affected by climate change and the unreliability of rainfall which extends the dry season. (...) The results indicate that women are more sensitive to climate change than men. The trend of farmers' perceptions of climate change is mainly dependent on traditional knowledge. The study also analysed the trends in farmers' perception. Thus, the analysis of survey results on society's perception of climate change and gender sensitivity is classified into four categories: reduced, increased, unchanged, and not responded. The results indicate that about 73.53% of interviewed farmers perceived that, in the long term, climate change would increase, depending on the local knowledge (Tab. 1). On the other hand, the survey results show that about 77% of the interviewed women are more sensitive to climate change than men (Tab. 2)."

6	Individual and community perceptions of climate change in Lower Mustang, Nepal	Bom, U.; Tiefenbacher, J.; Belbase, S.	Environment, Development and Sustainability	2022	10.1007/s10668-022-02291-w	"All respondents confirmed that they felt that climate change was already occurring in Lower Mustang and that it had begun to appear 30–40 years ago. Nearly all respondents reported that they discussed the impacts of climate change on their agricultural practices with others, either doing so often (59%) or occasionally (40%). The frequency of farmers' discussions about climate change varied among the communities (Table 2). Nearly seven in ten farmers in Kagbeni and Marpha said they often engaged in climate change conversations, while the farmers of Jomsom talked about this problem less frequently (Table 2). (...) All the farmers stated that they received information about the changing climate via social communications and their own experience were the two most important sources of information for them (Fig. 5). Discussions with other farmers and experts, as well as empirical and experiential evidences, were the most critical ways to develop an understanding of climate change and how it impacts Lower Mustang communities. Other significant sources of information for nearly half of the farmers were public seminars, talks, meetings, and print media. (...) About one-third of the research participants indicated that national radio and television programs focusing on agriculture provided them with vital information. Another third of the respondents, especially the youngest cohort (21–35 years), were informed about climate change and its impacts on social media via Facebook's news feed links. Moreover, about one-fifth of all farmers learned about climate change issues from researchers who visited their communities to undertake climate change studies. (...) More than 99% of farmers are convinced (73.5% strongly agreed and 26.5% agreed) that the average temperature has increased in Lower Mustang over the past 3–4 decades. (...) Marpha's farmers are more convinced that temperatures have increased in Lower Mustang (78% strongly agreed and 22% agreed) than the farmers in other communities (Table 4). The farmers in Marpha also indicated that they have been feeling warmer temperatures over the decades in their locality. Winds tend to be stronger at Jomsom, Kagbeni, and Tukuche, reflecting differential heating and cooling patterns in these locations. However, farmers in Kagbeni are less firmly convinced that temperatures have risen (only 68% strongly agreed), and this may indeed be due to elevation. The differences between villages were not significant ($p = 0.681 > 0.05$) (Table 3). (...) Male farmers of Lower Mustang are slightly more convinced than female farmers that temperatures have changed in the region over the past several decades—77% of males strongly agreed and 23% agree, whereas 70% of females strongly agreed and 30% agreed (Table 5). (...) Examined by age cohort, the study shows that more than 75% of those 36-years-old or older strongly agreed that temperature warming occurred in Lower Mustang (Table 6). However, within the 66 and older age cohort, 85.7% strongly agreed, and 14.3% agreed. (...) Both male and female farmers in Tukuchay strongly agreed that the perceptions of the elderly might be more accurate about the patterns of temperature rise in Mustang due to their long presence and robust experiences. However, farmers' opinions about temperature changes in Lower Mustang might have also been influenced by their agricultural activities. Nearly 29% of the farmers who grew cereals, apples, and vegetables strongly agreed that the temperature had increased in Lower Mustang (Table 7). In contrast, 24.5% of the farmers who grew cereals, raised livestock, and farmed vegetables strongly agreed, and 17.7% of those farmers who grew cereals, raised livestock, farmed vegetables, and grew apples strongly agreed (Table 7). Therefore, it might be inferred that farmers who grew apples and vegetables were the most convinced that temperatures had increased in Lower Mustang over the past 30–40 years. Likewise, within the categories of the arrays of agricultural practices, we saw some variations in farmers' confidence on changing rainfall patterns over the decades. Livestock ranchers, apple growers, and vegetable farmers unanimously strongly agreed (i.e., 100%). Cereal growers and livestock ranchers were somewhat split in the strength of their certainty (85.7% strongly agreed and 14.3% agreed). In addition, the combination of cereal farmers, livestock ranchers/vegetable growers were less certain (81.8% strongly agreed and 18.2% agreed) (Table 4). Again, the results revealed that the differences are insignificant ($p = 0.506 > 0.05$) (Table 7). The farmers in Marpha indicated that the apple farmers were the most affected in Lower Mustang over the decades because the quality and productivity of apples had declined primarily due to the rise in temperatures that led to pest infestations across the region. At the same time, most farmers perceived that the increase in temperature favored the growth of more varieties of vegetables across Lower Mustang in recent years, suggesting this as a positive climate change impact that had supplemented their household incomes. (...) In response, 87% responded that they either strongly agreed or agreed that rainfall patterns fluctuated more often, 11% were uncertain, and 1.5% strongly disagreed or disagreed. (...) Jomsom farmers were in greater agreement (96% strongly agreed or agreed) than the others. Kagbeni farmers were slightly less (92% strongly agreed or agreed), as were farmers from Tukuche (86% strongly agreed or agreed) and Marpha (74% strongly agreed or agreed) (Table 8). (...) Specifically, the farmers in Jomsom indicated that due to fluctuations in rainfall patterns, Jomsom had suffered many flash floods over the years that damaged irrigation canals and destroyed farming plots. (...) Many participants agreed that rainfall had been quite variable in all Lower Mustang communities, and it had been particularly unpredictable during the last 30–40 years. However, 26% of the respondents in Marpha were not convinced either way, and 4% of the farmers in Tukuche strongly disagreed or disagreed with this conclusion. The results in Table 9 shows that the differences between communities were statistically significant ($p = 0.005 < 0.05$). More than half (56.5%) of the respondents who were not convinced that rainfall had varied either way (i.e., neutral) were Marpha farmers (Table 8), indicating that they could not decide whether precipitation patterns were changing over the decades. The relationship between perceptions of rainfall patterns over the last 30–40 years and the gender of the farmers revealed that males were in greater agreement than females (91% of males strongly agreed or agreed, and only 83% of females agreed) (Table 9). More female farmers (17%) were either found to be neutral or disagreed that rainfall patterns were changing; whereas, only 9% of males were neutral or disagreed about the rainfall patterns (Table 9). There were significant differences ($p = 0.045 < 0.05$) between males' and females' perceptions of rainfall fluctuations in Lower Mustang (Table 9), since male respondents were more certain than women that rainfall had been fluctuating over the past few decades. (...) With respect to age, the largest group of farmers who believed that rainfall was fluctuating in Lower Mustang was the cohort between 36 and 50-years-old. This group comprised 32.2% of all respondents who strongly agreed or agreed that rainfall was changing, followed by the group between 51 and 65-years-old (26.4%), and those between 21 and 35-years-old (23.6%). Within these cohorts, however, those between 51 and 65-years-old were the most certain (97.9% strongly agreed or agreed) that rainfall had fluctuated in Lower Mustang (Table 11). Within age groups, there were significant differences in the level of confidence (agreement or disagreement) ($p = 0.023 < 0.05$) (Table 10). Age groups had different perceptions of the rainfall regime; for instance, the 36-to-50-year-old farmers expressed an enormous amount of uncertainty (60.9% were neutral, neither agreeing nor disagreeing those changes were occurring and that rainfall was less predictable) (Table 10). (...) Cereal–apple–vegetable farmers were the most confident (31% strongly agreed or agreed) in their perceptions of a changing and unpredictable rainfall regime. The livestock–apple–vegetable farmers were in complete agreement with each other: 100% indicated that they strongly agreed or agreed that rainfall patterns had changed and were continuing to change. In terms of strength of conviction, this group was followed by the cereal–apple–vegetable farmers (93% strongly agreed or agreed). The differences in perceptions of rainfall patterns were not statistically significant ($p = 0.098 > 0.05$) (Table 11). (...) In response, 75% strongly agreed, and 25% agreed that annual snowfall amounts had decreased. (...) The respondents in Jomsom (84% strongly agreed, and 16% agreed) were slightly more confident that snowfall had decreased than farmers in the other three communities: Tukuche had 80% strongly agreed and 20% agreed; Marpha had 70% strongly agreed and 30% agreed; and Kagbeni had 66% strongly agreed and 34% agreed (Table 9). Communities at higher elevations usually received more snow. (...) The statistics suggested that males were more confident that snowfall had decreased over the past several decades. Of the 150 respondents who strongly agreed with this view, 56.7% were males, and 43.3% were females. Among the males, 85% strongly agreed, and 15% agreed; among the females, 65% strongly agreed and 35% agreed (Table 13). (...) Those who most strongly agreed that snowfall had decreased in Lower Mustang over the past 30–40 years were the group of respondents between 36 and 50-years-old. They comprised a higher percentage (34.70%) of the respondents who strongly agreed that it was mainly because the group was made up of a larger percentage of surveyed farmers. However, the group with the highest proportion of members who strongly agreed, or 77.10% as opposed to those who agreed, was the 66 and older age group (Table 13). A 73-year-old farmer in Kagbeni who mentioned that Lower Mustang used to receive heavy snowfall—as much as 1 foot during the 1980s—but then received far less snow supported this view. (Table 13). Farmers who produced cereals, apples, and vegetables were a slightly larger plurality (27.3%) of the farmers who strongly agreed that snowfall had decreased over the past 3–4 decades. However, among those who strongly
6	Analyzing farm households' perception and choice of adaptation strategies towards climate change impacts: a case study of vulnerable households in an emerging Asian region	Baloch, Z.A.; Tan, Q.; Fahad, S.	Environmental Science and Pollution Research	2022	10.1007/s11356-022-19895-4	"Regarding climatic variables, 229 (60 %) of farm households perceived increase in flooding during the recent years, while 300 (79%) study participants perceived reduction in the precipitation in the study area. (...) During the household survey, 70 percent farm households perceived high occurrence of floods in the study area, while 20 percent and 10 percent of farmers reported moderate and low occurrence of floods in recent years. Sixty-five percent of farmers highly perceived reduction in rainfall, while 15 percent and 20 percent of farm households reported moderate and low perception of rainfall reduction. Similarly, 46 percent of farmers perceived high occurrence of droughts in the study area, whereas 23 and 31 percent of farm households reported moderate and low occurrence of droughts in the study area. Among all determinates of climate change, a large number of farmers perceived flood as high threatening indicator. (...) Firstly, farmers were asked about their perception towards climatic risks, and 68% of farm households perceived change in temperature, 47% of farm holds perceived irregularity in rainfall, while 39 % of the farmers perceived drought as climatic risk in the study area (as shown in Fig. 3). Study participants were then asked about their production risks, lack of inputs was perceived as major source of risk by 71 percent farmers, while 67 percent of farmers perceived crop diseases as the main risk sources at their farm level. Farm households perceived that reduction in precipitation, droughts, and floods are major threats to their farming due variations in climate".
2	Understanding Maharashtra Coastal Community's Perceptions and Livelihood Resilience to Climate Change Using the Community Participatory Approach	Sharma, R.; Jagtap, S.; Rao, P.	International Journal of Climate Change: Impacts and Responses	2022	10.18848/1835-7156/CGP/v14i02/1-19	"It was revealed that the local communities have started perceiving the irregularities and anomalies in the weather patterns and climate variations with respect to their livelihoods (Table 1). (...) The perceptions of resource-dependent communities regarding drastic environmental anomalies, pollution, resource depletion, overexploitation of resources, declining profitability, long-term impacts on future generations, and perceived inequity compared with modern industrial competitors point to the cognitive, experiential, and sociocultural factors behind the risk perceptions (Figure 2). ▪ "High season for fishing is between April and May and as cyclones and unpredicted rainfall have become frequent." ▪ "There is no accurate timing to catch fish. Fish spawning sites have also depleted. There is no certainty that we'll get fish this season, and there are also many changes in the fish behavior." ▪ "Rich and settled entrepreneurs are in a position to take benefits of government schemes, while traditional and poor members of communities are hardly able to survive. They overexploit the resources, and we get nothing for even day-to-day living." ▪ "Many fishermen carry on fishing in the spawning season, which is banned by the state. Moreover, depletion of fish stock is also affecting the livelihood of fishermen greatly…bottom trawlers and purse seiners have caused huge destruction to the traditional and marginalized fisheries, benefiting the mechanized fishing industry." ▪ "Coastal communities are facing threats from competitive commercial industries, the incursion of inappropriate technology, declining catch, and overfishing."".

2	Perceptions and adaptation strategies for climate change from small ruminant in North-West Cameroon	Tendonkeng, F.; Arnaud, H.T.B.; Noumbissi, M.N.B.; Miégoué, E.; Sawa, C.; Essie, F.M.N.; Mboko, A.V.; Tovignon, G.Z.; Nde, A.N.; Tedonkeng, E.P.; Vargas-Bello-Pérez, E.	Tropical and Subtropical Agroecosystems	2022		"According to their perception on climate change, the majority of farmers (72%) had observed a change in climate in the past decades (Figure 1). The distribution of farmers according to the possible causes of climate change (Table 2) shows that on average 27.67% of farmers never perceived any change in climate. (...) From all respondents, 11.08% think that deforestation does not influence climate change while 43.37% of respondents do. Concerning population growth, 46.08% of opinions considered it as the major cause of climate change while 11.9% were against it. Around 46.51% respondents declared that overgrazing may affect climate change while 42.07% declared the contrary. (...) On average, the majority of farmers of this zone highly disagreed that population growth can be a cause for climate change. On average, most of the farmers highly disagreed that overgrazing is a cause of climate change, followed by 32.21% who simply agreed, 13.75% who had no idea and 9.86% who highly agreed. The distribution of farmers based on their response to temperature variation as an indicator to climate change is presented in Table 4. As mentioned earlier, 27.61% did not perceive any change in climate in the past decades. Among those who perceived a change, most farmers highly agreed that temperature has increased over the past decade indicating that climate is changing. Thus, an average of 41.03% farmers (which is the majority) highly agreed that there has been a rise in temperature over the decades indicating that climate is changing, with 29.26% who highly disagreed and 2.05% who agreed. (...) Around 41.03% of respondents highly agree that there is a rise of temperature while 29.26% highly disagree about it. (...) Most of the farmers who highly agreed that there has been increases in rainfall over the decade and which served as an indicator of climate change were on average (52.84%) highly disagreed that increases have been observed and thus cannot be an indicator, while 19.18% of farmers thought increased rainfall had been observed. (...) Around 19.18% of respondents highly agreed that there is an increase in rainfall, 35.71% of respondents declared that there is a decrease in rainfalls whereas 10.64% of respondents are of the opinion that there is no change in rainfalls."
10	Indigenous Kinabatangan Perspectives on Climate Change Impacts and Adaptations: Factors Influencing Their Support and Participation	Pimid, M.; Nasir, M.R.M.; Scian, J.; Ahmad, A.G.; Mutalib, A.H.A.; Perijin, J.	Sustainability	2022	10.3390/su14116459	"Most respondents stated they experienced reduced crop yield and fish catchment because of extreme weather changes in this region, including climate-related health problems. Some of the health problems reported by the respondents were flu and skin itchiness, which they perceived were difficult to heal (compared to the time when they were young), and they attributed this problem to the changing weather. Respondents who worked in the conservation sector reported degradation of biodiversity values, vegetation change, and destruction of forest cover. In contrast, those working in tourism enterprises were more concerned about low tourist visits during unfavorable weather, reducing tourism revenue. Respondents involved in subsistence farming cultivated small-scale oil palm and fruit crops. Heavy rain led to flooding, causing significant damage to young oil palms and fruits. (...) The respondents reported climate hazards negatively affecting their survival and livelihoods.
10	Perceived Climate Change and Determinants of Adaptation Responses by Smallholder Farmers in Central Ethiopia	Megersa, G.G.; Jaleta, M.; Tesfaye, K.; Getnet, M.; Tana, T.; Lakew, B.	Sustainability	2022	10.3390/su14116590	"Farmers in the study area perceived the presence of both climate variability and change and their impacts. Accordingly, households experienced the risk associated with water source availability, depletion in soil fertility, the risk of crop failure, crop yield reduction, and risk associated with livestock feed, respectively (Figure 2). The results of the focus group discussion and key informants emphasized that rain had become more erratic, and whenever it came, it was often in heavy falls that caused floods and little infiltration. Moreover, farmers indicated that climate change had caused irregular droughts and a high incidence of pests and diseases, which negatively affected livestock and crop production. The focus group discussions and key informants acknowledged the significant increase in crop damage by pests and diseases, including weeds. (...) Respondents (63.3%) claimed to experience dry spells during the rainy season, which sometimes led to the drying and scorching of crop leaves and, ultimately, retarded crop growth and reduced yield. Approximately 16.7% of respondents recalled that whenever a dry spell occurred during the critical periods for crops, it led to a low yield or crop failure. Moreover, a significant number of smallholder farmers perceived those high temperatures particularly at the beginning of the rainy season and during long spells, usually burning germinating seeds. Smallholder farmers also acknowledged the significant increase in crop damage by pests and diseases, including weeds. They related an increase in temperature and decrease in rainfall to the proliferation of pests and diseases. A significant number of them reported experiencing an unpredictable and unreliable onset and cessation of rains and the shrinking of the growing season. There were differences among sample households in their perception of climate change (Figure 3). Respondents 10, 18, 30, 28, 16, 9, and 6 perceived climate change parameters (rainfall, minimum temperature, and maximum temperature). However, only three respondents did not perceive climate change at all. The majority of those indicated that they had experienced higher temperatures, droughts, changes in planting time, and a decrease in crop yield for the changing climate."
6	Perceptions and attitudes towards climate change in fishing communities of the Sudd Wetlands, South Sudan	Benansio, J.S.; Funk, S.M.; Lino, J.L.; Balli, J.J.; Dante, J.O.; Dendi, D.; Fa, J.E.; Luiselli, L.	Regional Environmental Change	2022	10.1007/s10113-022-01928-w	"All interviewees reported they gained information on the weather from their own observations (Fig. 2). The most popular external source of weather knowledge was from radio (44 to 67% in the three study sites), followed by NGOs (24 to 33%). All other information sources were less used: television (16% across the three study sites), newspapers, meteorological services, and schools and teachers (each 7%). A higher percentage of interviewees in Terekeka used newspapers, radio, meteorological services, and NGOs, where the highest education levels were observed. (...) Climate change was described to have impacts on all aspects of fishers' livelihoods (Fig. 3). Across the three study sites, more than 90% of interviewees agreed or strongly agreed with the statements on decline of fish catch (98%), disappearance of economic important fish species (92%), decline in quantity of fish landing (98%), destruction of houses in fishing villages (100%), changes in fishing calendar (92%), reduced fish trading activities (98%), equipment damages and lost (98%), and damaged landing areas in fishing villages (100%). Support was less strong for loss and degradation of breeding grounds (50%), reduced fish size (37%), reduced fishing efforts (27%), and psycho-social problems (77%). Only for two probed statements, loss of lives and new fish species, disagreement was more widespread (standard/ strong agreement versus standard/strong disagreement: 35% versus 33% and 40% versus 15%, respectively). (...) Fishers were aware of changes of climate hazards over the last 10 years (Fig. 4). From the five different changes inquired by the interviewers, all were affirmed by the majority in all three areas (unpredictable timing of seasons: 88%, erratic rainfall: 75%, incidence of high temperature: 100%, serious floods: 81%, and serious droughts: 95%). (...) Fishers agreed or strongly agreed on the anger of God (85% across study sites), on the ancestors punishing for people's wrong doings (59%), uncontrolled harvest of forest resources (97%), and natural variability in the climate (82%) on the causes for climate change (Fig. 5). Only human population growth was disagreed with more often (21%) than agreed with (11%). (...) Study sites difered from each other in their combination of climatic parameters but no systematic deviation for any of the communities was observed, e.g., no differences were observed for the incidence of high temperature whereas Northern Terekeka showed a higher unpredictability of the timing of seasons and a lower incidence of serious foods compared to the other communities."
6	Assessment of Status of Climate Change and Determinants of People's Awareness to Climate-Smart Agriculture: A Case of Sarlahi District, Nepal	Adhikari, S.; Rawal, S.; Thapa, S.	Advances In Agriculture	2022	10.1155/2022/1556407	"Among 102 respondents, nearly everyone was unaware of the term "climate change" initially, but with further discussion, some of them were found to be familiar with it. Approximately 58.8% of the total population was found to have a better understanding of climate change (Figure 3). e term "climate change" was completely novice for the remaining 41.2% of the total population. Radio was found to be the main medium for the dissemination of the information and revealed that 84.35% of the total population heard about climate change from radio, 13.46% knew about climate change from television, and 2.19% knew from both radio and television (Figure 4). (...) The majority of the respondents (65.68%) revealed that there was untimely rainfall in the rainy season with more intensity, and 34.31% said that there was an intense early onset of the rainfall. (...) Approximately 79.41% of the total respondents gured out that rice crops have been adversely a ected by changes in rainfall patterns. Rice and vegetables were affected by 18.62%, and 0.98% concluded that rice, vegetables, and sugarcane were a ected, followed by rice and sugarcane crops (0.98%) (Figure 5). (...) Winter season crops, such as maize, wheat, potatoes, mustards, vegetables, lentils, and sugarcane, are reported to be a ected by winter season rainfall."
1	When Ice Turns to Water: Forest Fires and Indigenous Settlements in the Republic of Sakha (Yakutia)	Vinokurova, L.; Solovyeva, V.; Filippova, V.	Sustainability	2022	10.3390/su14084759	"Rural residents in four uluses of the Sakha Republic—Ust-Aldan, Nam, Khangalass, and Oymyakon—argued that climate change is happening and expressed their concerns. The proportion of respondents who, without doubt, perceive climate change as a threat to well-being is high (Figure 6). (...) As seen from Figure 5, 70.1% of respondents in the Nam ulus, 78.6% in Khangalass, 78% in Ust-Aldan, and 74% in Oymyakon perceived climate change as a threat. Survey respondents emphasized the danger of regular droughts and abnormally high summer temperatures. Moreover, 82.1% of the respondents in the Ust-Aldan ulus, 46.6% of respondents in the Nam ulus, and 45.8% in Khangalass were concerned about the drought. In addition, 46.6% of the survey participants in the Nam ulus think that the drought has been brought on due to climate change; almost the same number of responders in the Khangalass ulus believe this as well (Figure 7). (...) However, in Oymyakon, people worried more about flooding (87%).(...) Overall, Indigenous peoples perceive natural disasters—forest fires and floods—as consequences of climate change. Other consequences of climate change are unusual and include intense winds and thunderstorms, which have happened more often in recent years. "
19	Traditional village roles and gender shape Samoan perceptions of climate change	Cassinat, J.; Cassinat, K. C; Segi, T.; Tavana, N.G.; Gill, R. A.	Current Research in Environmental Sustainabili	2022	10.1016/j.crsust.2022.100173	"On our three-point scale, we found that the greatest concern was high temperature with an average value of 1.67 with 65% of the responses receiving a rating of 2 or 3. Storms and related danger were also a high priority with an average value of 1.55 and 58% of the responses received a rating of 2 or 3. Medicinal plant decline was the lowest with an average value of 0.3 and only 11% of respondents rated it a 2 or 3. Both high temperatures and storms and related dangers are significantly higher priority than other climaterelated environmental changes including specifically medicinal plant decline ($p = 0.004$ Fig. 2).(....) We found no significant differences in climate-related environmental changes between males and females. For males, the highest priority was high temperatures with an average score of 1.9 priority and for females, the highest priority was storms and related danger with an average score of 1.58 (See Fig. 2). Males placed a higher priority on marine health decline and reduced agriculture while females placed a higher priority on financial hardship and storms."

3	Perception of transhumant herders on climate change and their adaptation strategies	Neupane, M.; Joshi, R.; Bhandari, D.; Awasthi, N.	Nature Conservation and Health	2022	10.3126/on.v20i1.43578	"Out of the total respondents, only 37% are clear about the term climate change. The majority were unclear and unaware of the term climate change (Figure 7). Most of the respondents had the opinion that summer temperature is increasing than before (75%). Similarly, they had the opinion that winter temperature (60%), melting rate of snow (85%) and the number of hotter days (72%) all are in an increasing trend (Table 5). (...) Herders were likely to experience erratic rainfall. They had the opinion that total rainfall in monsoon, total rainfall in winter, snowfall amount, and number of snowfall days all are in decreasing trend which is 58%, 65%, 79%, and 72% respectively (Table 6)."
11	Livelihood and production strategies of livestock keepers and their perceptions on climate change in the Central Peruvian Andes	Radolf, M.;.Wurzinger, M.; Gutiérrez, G.	Small Ruminant Research	2022	10.1016/j.smallrumres.2022.106763	"All interviewed farmers noticed changes in the climate. 63% of them mentioned noticeable changes in the seasons (rain during the dry season, less or no rain during the wet season). 33% of the farmers said that there is less rainfall over the whole year, whereas 33% stated that they observed an increase in the last ten years. There were also different perceptions of temperature changes as 30% of the farmers mentioned an increase, whereas 70% claimed a decline. An increase in frost and snow was reported by 65%, whereas 7% observed the opposite. In addition, stronger wind was also reported by 9% of the interview partners. More than half of the interviewees said that the pasture was affected negatively by the weather conditions. Almost all farmers (98%) observed more diseases in their livestock and related higher mortality and linked these observations with climate change."
6	Agro-pastoralists' perception of climate change and adaptation in the Qilian Mountains of northwest China	Xie, S.; Ding, W.; Ye, W.; Deng, Z.	Scientific Reports	2022	10.1038/s41598-022-17040-2	"Among the 565 agro-pastoralists, 554 had heard about climate change and about 500 believed that climate is changing. Agro-pastoralists understood climate change by diferent indicators. In the case of temperature, a vast majority of the respondents (83.03%, summer/68.95%, winter) perceived that there have been changes in temperature in the district. Similarly, there have been changes in rainfall in the district as reported by 77.08% (rainfall)/72.74% (snow) of the respondents. In terms of quantity, the majority of the respondents (39.53%) perceive a decrease in rainfall, the next majority of respondents (37.55%) feel that rainfall is increasing. and about 4.69%/7.58% respondents feel that rainfall is unpredictable in terms of quantity (some_x0002_times high, sometimes low). Regarding the changes in temperature, the majority of respondents have noticed the rising summer tem_x0002_perature (71.3%), while 11.73% of the respondents perceive that the decreasing summer temperature. For the winter temperature, nearly 32.31% perceive that winter is becoming colder while nearly equal percentage of the respondents (36.64%) perceive that winter is getting warmer. In our study, there are 3.25–7.58% of respondents who do not perceive any changes in temperature; yet this is nearly equal compared to those who did not perceive any changes in rainfall."
6	Livelihood vulnerability assessment and climate change perception analysis in Arunachal Pradesh, India	Rehman, S.; Azhoni, A.; Chabbi, P.H.	GeoJournal	2022	10.1007/s10708-022-10703-7	"The local communities, mainly engaged in agricultural activities, reported that the climate change induced extreme events such as cloud burst and su_x0002_sequent torrential rainfall not only damaged the agricultural crops but also reduced the crop productivity over the years. Since over 80% of agricultural land are under rainfed cultivation, the erratic weather has caused either too much rain in short period of time or less rain during the crop cultivation that adversely impacted the crop yield. Besides, changing temperature also brought about various diseases which have caused decrease of yields. As a result, people are using more and more chemical fertilizers that further degrade the soil fertility and reduced yields after certain point. (...) "Climate change has influenced almost everything. Changes in rainfall and temperature are visible. The temperature has increased these days which have resulted in decreasing yields. We see either too much or too little rainfalls,often at the wrong time and is leading to water scarcity, and crop failure. Besides, multiplediseases have come up with climate change which have also decreased the agricultural yields (Boga Laye, 57, farmer in Nyigam village of Upper Siang district)." (...) The farmers and cattle ranchers perceived that climate change, with changing tem_x0002_perature and rainfall, led to decline in forage quaity and heat stress, has negatively afected the livestock rearing in the region. (....) The field observation and interviews also revealed that high altitude regions have become vulnerable to vector borne diseases such as malaria due to change in the temperature. (...) "One of the major causes of climate change is deforestation. The man-made natural hazard like landslide is killing indigenous people by destroying the land they depend on for their survival. More frequent and intense rainfall events due to climate change has caused landslides, which is destroying towns to cutting off drinking water and transportation networks (Beta Menjo, 54, vegetable seller from Arzoo village of Dibang valley)". In addition, the local communities also expressed that they experienced changes in their everyday lives due to climate change induced extreme events."
6	Farmers' perceptions of climate change in Lower Mustang, Nepal	Hamal, R.; Thakuri, B.M.; Poudel, K.R.; Gurung, A.; Yun, S.J.	Environmental Monitoring and Assessment	2022	10.1007/s10661-022-10286-3	"The majority of local farmers, especially senior people, thought that temperature has been rising in recent decades. Approximately 82% of respondents reported that temperature significantly increased, while 15% of farmers also agreed that the overall temperature increased (Fig. 7). In contrast, only less than one percent of people could not decide whether it was changed, while only 2% disagreed with this perspective of rising temperature. Overall, almost all (approximately 95%) of the respondents perceived changes in precipitation patterns over the last four and half decades (Fig. 7). The distribution of the farmers' perceptions about the changes in rainfall patterns showed that over 90% of farmers experienced a change in the pattern of precipitation, and the remaining minimal proportion disagreed with this change. In contrast, most of the respondents (94%) claimed that there has been a significant decline in snowfall over the last few decades. (...) The majority of people highlighted various types of adverse effects of climate change, such as the unpredictable timing of precipitation causing worse decisions on planting, harvesting, and storage. Many reported that a rise in temperature increases the pest and insects, which directly results in spending more money on pesticides, insecticides, and other chemical fertilizers. Thus, most believe the decrease in production, quality, and crop damage are due to changes in climatic factors such as a rise in temperature and rainfall and a decrease in snowfall."
10	Ecological and Hydrological Indicators of Climate Change Observed by Dryland Communities of Malipati in Chiredzi, Zimbabwe	Chanza, N.; Musakwa, W.	Diversity	2022	10.3390/d14070541	"As Table 3 indicates, almost all the respondents (98%) agreed that they had experienced some changes in terms of either early drying up of rivers and streams (72%), or the rapid loss of water in them (27%). The effects of the perceived high temperatures and little rainfall were also largely felt as swamps were reportedly drying up earlier (79%), or some places becoming less swampy (8%) or desiccating completely (7%). The respondents also witnessed noticeable changes in ground water recharge where the water table is said to be very deep (48%), deeper (38%) and inaccessible in some places (6%).(...) Table 4 captures the respondents' perceptions of climate change in terms of observed changes in ecological processes. There is a trend towards loss of wild fruits, which the respondents perceived to be caused by climate change. This was revealed by 86.2% of the people interviewed, whereas very few indicated that they were not sure of such changes (7.8%), or there was no change at all (3.4%). Only 2.6% perceived that there were more fruits found in the area.(...) Most of the respondents perceived increases in insects (78%), birds (58%) and predators (63%), whereas increases in wild animal herbivores were reported by 46%. The perceived increase in predators could be related to reported high incidences of predation on domestic animals (71%), aggressiveness of wildlife (53%) and crop raids by wild animals (55%). A significant proportion of the respondents thought that the decrease in woodlands and grasslands was related to climate change; 88% and 80%, respectively."
2	Impact of climate change on agricultural production: A case of Rasuwa District, Nepal	Dawadi, B.; Shrestha, A.; Acharya, R.H.; Dhital, Y.P.; Devkota, R.	Regional Sustainability	2022	10.1016/j.regsus.2022.07.002	"Most respondents (62.86%) had lower than average perceptions of the impact of climate change on agriculture production were found to be lower than the average level (Table 2). However, local people have certainly experienced climate change. A significant proportion of the respondents (7.14%) were in the study area, including those who believe and understand that climate change has been occurring. On the other hand, 30.00% of the respondents were not likely to understand well or even skeptical of the evidences of climate change, while a considerable number of the respondents (62.86%) were completely unaware of climate change and its impact.(...) Almost half of the respondents perceived that temperature is increasing (Fig. 7a). It was more visible over the last two decades. Especially, the increase of summer temperature was greater than that of winter temperature. About 30.00% of the respondents did not agree with the temperature change while the rest responded to the temperature decrease. (...) People's perceptions on summer monsoon and annual mean temperature matched the observed data, as shown in Table 1 and Fig. 4. But in the case of winter temperature, the observed trends were opposite. It was observed that the local people regarded the increased frequency of heavy precipitation as an indicator of climate change. Fig. 7a showed that there was uniformity in people's perceptions, 52.00% of the respondents reported a decrease in precipitation and about 39.00% disagreed with the changes in both precipitation amount and time pattern. Similarly, more than half of the respondents (60.00%) agreed with the decrease in winter precipitation.(...) More respondents from the Langtang area had the public opinion of erratic monsoon precipitation along the trekking route. It is important to note that the respondents with the age range of 45–60 years old agreed with the increasing trend of intense precipitation, but they informed that both rainy events and durations were decreasing, consisting with the finding of Devkota et al. (2020). About 20.00% of the total respondents also agreed with perceiving strong climatic variability, 61.43% reported delay in monsoon onset, 54.29% observed intermittent dryness, and 50.00% experienced decreasing of soil moisture.(...) Moreover, 92.87% of the respondents mentioned a decrease in snowfall in the study area (Fig. 7a). The respondents had different perceptions about crop production trends (Fig. 7b). In the case of millet and wheat, more respondents reported a decrease in production, while a high proportion (69.23%) reported an increase in potato production. Maize production has increased by 38.46%. It is noteworthy that the respondents from the mid-elevation regions reported increasing trends of production compared to those from the lower elevation regions."

2	Changing Climatic Conditions and Shrinking Agricultural Land: A Community Based Study in Betalghat Development Block, Kumaun Lesser Himalaya	Kevla, N.; Tiwari, P.C.; Dheeraj, P.; Rahul, K.	Disaster Advances	2022	10.25303/1506da01010	"The analysis of community perception reveals that maximum people (more than 90%) are well aware of the changes in the climate and adopting various methods to cope with the risk of variations in agricultural operations due to the climate change such as the selection of less irrigated crops and production of cash crops (Table 3). All households (n=300) have experienced climate shocks for the last 30 years by intense storms, extra heat and cold spells.(...) Table 3 shows that 276 (92%) of the households (respondents) perceive an increase in average temperature together with a change in precipitation regime and a large mass (n=288 or 96%) strongly believe that the agrarian land is shrinking due to the climate change.(...) About 282 (94%) of the households strongly believe that the timing of seasons has been changed, especially during the winter season, due to the late start and early melt of snow which adversely affects the agro-horticultural operations. Moreover, duration, amount of rainfall and rain become intense and erratic reported having changed significantly by 279 (93%) respondents. Besides rainwater, the primary sources of water for the people in the study region are rivers, springs and streams and the present study shows a mixed response on the level and availability of water where 282 (94%) of households reported fluctuations in the discharge of the streams and springs. (...) Table 4 shows that 90% of the key informants perceive an increase in average temperature and a change in precipitation regime. All informants (100%) strongly believe that agrarian land is shrinking due to climate change. Apart from KII and household level study, we calculated the FGDs data and carefully observed and analyzed it, revealing that the study region has been facing climatic shocks for the last 20 to 30 years by intense storms, extra heat and cold spells. Moreover, the duration of rainfall, amount of rainfall and rain become intense and erratic and are reported to have changed significantly by 90% of the key informants. Also, 80% of the key informants reported that a significant portion of precipitation is now being received in the rain. Almost 100% of the informants strongly believe that the timing of seasons has been changed, especially during the winter season."
6	Spatiotemporal Changes in Mean and Extreme Climate: Farmers' Perception and Its Agricultural Implications in Awash River Basin, Ethiopia	Damtew, A.; Teferi, E.; Ongoma, V.; Mumo, R.; Esayas, B.	Climate	2022	10.3390/cli10060089	"Farmers from different agroecology zones perceived climate change, variability, and extreme events over the last two decades. Most interviewed key informants, focus group discussants, and surveyed sample farmers in different agroecology (89.3%) perceived changes in climate (Table S3). Focus group discussants indicated that the main source of information for climate change came from personal experience, radio broadcasts, and training given at different times by development agents. Furthermore, they elaborated on the changes in climate through changes in rainfall patterns, amount, and length of the rainy and dry seasons. One focus group discussant from a hot–warm semiarid AEZ stated the change and its impacts brought in his village, as follows: "Climate in our area is changing. Compared to our youth time, the rain does not come on time . . . ., sometimes we experienced unexpected rainfall. The late rain during the main season is harming our agriculture".(...) The majority of respondents, from cold–very cold humid, tepid–cool humid, hot–warm moist, and hot–warm arid AEZs, perceived an increase in temperature in their area. Compared with the farmers' perception, the Mann–Kendall trend analysis of temperature (Tmax and Tmin) result shows a significant increase in all agroecology except for hot–warm semiarid, where temperature decreases (Table 2 and Figure 3). (...) The majority of farmers across agroecologies believed that the annual rainfall had decreased. (...) A key informant interview conducted with woreda agricultural office heads in the study area showed that all informants know about changing rainfall, temperature, and extreme climate events. Key informants from Lode Hitosa woreda stated the following: "Recently, we are observing changes and variation in climatic elements, which we believe as one of the contributors to the reduction of crop yields". The key informant further elaborated on the situation as "the variability in rainfall and temperature is affecting crop productivity by introducing crop pests and disease". A key informant from the Merti Woreda Agriculture office stated the following: "It is observable that there is climate change and variability in our woreda. Because of woredas' agroecological location, where almost half of the area is located in lowland, frequent drought experience, crop pest and disease, the animal disease is the main indicator of climate change in the woreda". Table S3 shows farmers' perceptions of the number of warm days and cold nights. The study revealed that farmers from different agroecologies perceived an increase in warm days (76.6%) and cold nights (63.3%). However, the result was wide-ranging between agroecologies (Table S3). All the respondents from the hot–warm semiarid agroecology and 82.9% from the hot–warm semiarid agroecology perceived a change in the number of warm days.(...) Farmers from hot–warm moist and hot–warm semiarid agroecology zones perceived an increase and decrease in the number of cold nights, respectively.(...) The descriptive statistics show that about 68.3% of farmers in the entire agroecology perceived an increase in drought frequency in their area. However, there is variation across agroecologies, where 75.9%, 65.6%, 62.4%, 60.7%, 61%, and 54.2% of farmers from tepid– cool sub-moist, hot–warm semiarid, tepid–cool humid, cold–very cold humid, hot–warm arid, and hot–warm moist perceived an increase in drought years, respectively (Table S3). A focus group discussant from tepid–cool humid stated the occurrence of frequent drought in his village, as follows: "In previous years, our area is known with better rainfall, even several times of summer season; rainfall did not allow us to out from our tukul. But, in recent years, the rain is significantly decreasing, and rainfall amount we used to see in the arid area is coming to us".(...) Regarding the perceived impacts of climate change, variability, and extreme events, farm households perceived effects, including food and other product inflation (91.4%), a decrease in crop productivity (84.6), an increase in crop pests and diseases (83.8), increase in livestock disease (77.3), emergence of new pests and weeds (73.4), shortage of water for irrigation (59.1), and initiating conflict over decreasing resources (38.8) (Figure 15)."
6	What affects farmers in choosing better agroforestry practice as a strategy of climate change adaptation? An experience from the mid-hills of Nepal	Paudel, D.; Tiwari, K.R.; Raut, N.; Bajracharya, R.M.; Bhattarai, S.; Sitaula, B.K.;	Heliyon	2022	10.1016/j.heliyon.2022.e09695	"Farmers reported experiencing severe climatic events; unpredicted rainfall, oscillation in temperature, drought, flood, landslide, and violent winds in recent years (Figure 4). Though most of the respondents experienced multiple climatic events, 91% of the total respondents had experienced at least one form of such events. However, only 59.29% of respondents were aware of climate change and also believed that climate change was responsible for these climatic events. More males (53%) were found to be aware of climate change compared to females (47%). 51% of respondents agreed that climate change was accountable for decreasing temperature and heavy rainfall, whereas 48% believed climate change was the cause of untimely rainfall, heavy hailstone, and cold waves.(...) However, some farmers did not perceive these problems as the effect of climate change. Out of the total respondents, 91% experienced climatic events, while only 55.24% of them were adopting different strategies to reduce climate change impacts (Table 3)."
6	Farmers' Perception of Climate Change and Climate-Smart Agriculture in Northern Benin, West Africa	Moutouama, F.T.; Tepa-Yotto, G.T.; Agboton, C.; Gbaguidi, B.; Sekabira, H.; Tamò, M.	Agronomy	2022	10.3390/agronomy12061348	"The perception of climate change was assessed through the main climate parameters that farmers can easily understand. More than ninety-eight percent (98.4%) of the surveyed farmers recognized that the temperature in the study area is changing, and 92.9% observed that the weather is becoming warmer. Almost all the surveyed farmers (99.7%) acknowledged that rainwater quantity has changed compared to the previous years and for 98.1% of them, the weather is becoming drier. In addition, 88% of the surveyed farmers think rainfall comes later than in previous years. Nevertheless, a high percentage (88%) of farmers are not able to forecast how the coming season is going to be. Sixty-nine percent (69.7%) of the farmers have heard about climate change phenomenon through media, NGOs, other farmers, their neighborhood, meetings, agroecology trainings, local agricultural services, and traditions. The major means of information are media (33.7%), meetings (10%), NGOs (9.2%), tradition (5%) and the neighborhood (4.2%)."
6	Climate change adaptation and adaptive efficacy in the inland fisheries of the Lake Victoria basin	Nyboer, E.A.; Musinguzi L.; Ogutu-Ohwayo, R.; Natugonza, V.; Cooke ,S.J.; Young, N.; Chapman, L.J.	People and Nature	2022	10.1002/pan3.10388	"People in Ugandan fishing households on Lake Victoria and Lake Nabugabo are highly exposed to and aware of the biophysical effects of climate change. Commonly perceived effects included changes in seasonal rhythms, including increased frequency of extreme events (i.e. droughts, 86%; floods, 51%) and changes in wind and storm patterns (31%) (Table 4). Most fishers stated that rainy and dry seasons were becoming more intense and less predictable (Table 4). Fishers also noted other forms of anthropogenic environmental degradation, especially destruction of wetlands (37%) and forests (56%). Many respondents mentioned rapid human population growth (22%) as an important component of environmental change (Table 4). Environmental changes were perceived to affect availability of fish resources (Table 4). At all landing sites, fishers reported decreases in catches of Nile perch and Nile tilapia. There was general agreement that fish sizes and abundances tended to decrease during droughts and increase during floods and that fish movement patterns were tightly connected to changes in wind and precipitation. Catch reductions were also attributed to wetland and forest degradation (Table 4). Other negative impacts of droughts included crop failure, reduced incomes and high food insecurity (Figure S1, Table 4). Floods, if not severe, were associated with increased incomes and food security through better fish catches. However, excessive flooding led to crop failure, road blockages, damage to infrastructure and higher post-harvest losses (Figure S1; Table 4).

6	Indigenous knowledge indicators employed by farmers for adaptation to climate change in rural South Africa	Kom, Z.; Nethengwe, N.S.; Mpandeli, S.; Chikoore, H.	Journal of Environmental Planning and Management	2022	10.1080/09640568.2022.2086854	"One-third, which represented 33.2% of farmers, have a very high level of climate change knowledge, 50.8% have a high level of knowledge, 8.5% have a very low level, 4.5% have a low level, and only 3% have no knowledge (Figure 2).(...) During focus group discussions, it was evident that farmers in Nwanedi and Levubu have historically utilized a number of indigenous indicators for weather forecasts based on socio-cultural and environmental beliefs, but with limited documentation. During the field survey, major indicators employed by farmers for forecasting weather and climate change were analyzed. These indicators were used to make farm-level decisions concerning farming systems, such as planting time and the selection of crop types. Such decisions may be based on unreliable information used at the beginning of planting; however, farmers realize that at the beginning of the rainy season the rains give them an idea of how the remainder of the growing season will unfold. Erratic rainfall may trigger misinformation and deceive farmers, as the dry season may be extended.(...) Farmers in Vhembe district are able to interpret weather signals by the actions of certain plants in the absence of traditional weather forecasting. Also, during group discussions, a respondent in Nwanedi asserted that his great grandfather handed him the interpretation of weather condition signs from the behavior of both plants and animals. Indigenous wisdom shared by forefathers who have learned agricultural expertise, is a long-standing and proven weather forecast know-how from which farmers have benefited.(...) With increasing climate variability and first-rain uncertainty, most of the decisions made by Levubu and Nwanedi Indigenous farmers are based on personal experience. Results gathered from questionnaires indicated that an average of 63.7% percent of respondents in the study site employed IKS to forecast the quality of the planting season so as to make informed farming decisions and manage crops in the changing climatic environment. Results in Table 2 indicate that a total of 64% of farmers used flowers for weather forecasting in deciding to change planting dates (Jiri et al. 2016; Masinde 2015; Nganzi et al. 2005), while 44% and 72% used wind movement and behavior of new leaves on baobab trees, respectively to indicate the potential for rain in a few days' time.(...) For both mist-covered mountains and the appearance of red ants, 52% narrated that these were used as a potential drought season indicator. Only 30% of the participants used black ants as an indicator of good rain at the beginning of the rainy season to indicate that farmers should get ready for planting.(...) Farmers' preference is for signs as traditional networks of weather information are limited, with only a few functioning weather stations in the district of Vhembe. Traditional awareness of the climate conditions in the study area could have influenced the way in which most rural farmers responded to the various impacts of climate variability and change. The results reveal the role of traditional knowledge practices in climate change strategies. Rural farmers have limited knowledge about the concept of climate variability and change, although, they have observed and experienced changes, such as decreasing rainfall, early cessation of rainfall, increases in temperature, frequency of drought, and shorter growing seasons. During interviews, the majority of respondents (64%) in the district, employed IKS weather forecasting to grow crops and adopt specific farming operations based on the signs in the environment. (...) The findings also, indicated that about 72% of farmers both in Nwanedi and Levubu used tree characteristics as indicators within traditional forecasting systems; and 56% indicated that they used other indicators, such as the movement of stars. This movement of stars under clear skies means rain will fall in a few days to come; 90% of respondents in Nwanedi indicated, that the unfurling of new leaves on the baobab tree is a sign of a heavy rainy season. (...) Older farmers in Nwanedi and Levubu reported that winds moving from west to east show the occurrence of rain within 12 h. During the focus-group discussion, participants also revealed that the behavior of insects sometimes predicts the occurrence of crop disease challenges during the planting season."
1	Climate Variability in the Sudanian Zone of Cote d'Ivoire: Weather Observations, Perceptions, and Adaptation Strategies of Farmers	Timite, N.; Kouakou, A.T.M.; Bamba, I.; Barima, Y.S.S.; Bogaert, J.	Sustainability	2022	10.3390/su141610410	"Almost all these people (99.60%) have observed climate variability in their locality and were even able to clearly mention the different manifestations as well as the impacts on crops. (...) All farmers clearly mentioned the manifestations of climate variability in their locality, with significant differences. The most recurrent manifestations are illustrated in Table 3. Thus, the main manifestation of climate variability concerns rainfall. Indeed, regardless of the locality, the shortening of the rainy season (75.95%) and the irregularity of rainfall (84.67%) during the rainy season are the manifestations of variability most mentioned by the farmers. However, depending on the locality, other manifestations were more frequently mentioned, such as the increase in temperature observed mainly in Tienko and Tengréla, and the prolongation of the drought and the increase in rainfall intensity observed in Ouangolodougou.(...) The most notable impacts are the decrease in crop yields, particularly in Tengréla (92.16%) and Tienko (96%). However, farmers in Tienko also reported an increase in insect attacks on crops (35%) and early crop drying (86%). On the other hand, 97.43% and 51.28% of Ouangolodougou farmers respectively cited disruption of the cropping calendar and crop flooding as the main impacts of climate variability in their locality."
1	Farmers' Risk Perception on Climate Change: Transhumance vs. Semi-Intensive Sheep Production Systems in Turkiye	Yetisgin, S.O.; Onder, H.; Sen, U.; Piwczynski, D.; Kolenda, M.; Sitkowska, B.; Yucel, C.	Animals	2022	10.3390/ani12151992	"A significant number of respondents have heard about "climate change" (91.2%), and 53.1% were using television as a primary information source for the weather forecast. Computers and the internet were pointed to as the primary information source in terms of creating a perception about climate change, and they are evaluated in this context.(...) Unsurprisingly, 91.2% of farmers were aware of climate change. Most respondents perceived that climate change is (93.1%) caused by both natural and anthropogenic means.(...) Both farming systems perceive climate change. Although farmers are aware of climate change and the contribution of livestock practices to climate change, they lack an understanding of emission production patterns. Most of the interviewed farmers perceived many changes in climatic factors in their regions over the last 20 years. The transhumance system, which relies entirely on natural resources, is more affected by the impacts of climate change. Most farmers acknowledged a severe rise in temperature and extreme weather events. Farmers perceived an increase in temperature (94.73% of transhumance and 93.1% of semi-intensive system farmers), extreme weather events and disasters such as windstorms (65.79% and 37.93%, respectively), and droughts (54% and 39%, respectively). They also stated that precipitation decreased by 44.8%; however, 49.3% of farmers noticed that it had become "unreliable". Farmers noted that "it may not rain for a long period within the rainy season", and some indicated that "there is unexpected rainfall during the dry season, which is unusual". Many farmers reported changes in precipitation intensity, onset, and duration."
1	Effects of climate change on pastoral households in the Harshin District of the Somali Region, Ethiopia	Abrham, T..; Mekuyie, M.	Jamba-Journal of Disaster Risk Studies	2022	10.4102/jamba.v14i1.1202	"The majority of key informant interviewers and FGD participants recognised that rainfall amount, timing and distribution in the study area had changed and varied over the 35-year period investigated. Farmers also stated that the length of the rainy season had changed. According to the findings, 95.8% of respondents noticed a drop in the number of rainy seasons, with late onset and early cessation (Table 2). Furthermore, 23.8% said the seasonal rainfall distribution was erratic. As a result, rainfall unpredictability could have serious effects for pastoralists' livelihood. (...) Participants in the FGDs agreed that today's interannual rainfall variability was high and that the start and duration of the rainy season had become unpredictable, making cropping and pastoral activities more difficult to plan and worsening the area's already severe feed and water shortage.In terms of temperature, 94.4% said that the study area's temperature had risen (Table 3).(...) Drought incidence was examined during the past 35 years, and the majority of respondents from both production systems thought that the drought incidence had become more frequent. Figure 2 shows that 78% of respondents reported that droughts occurred every 3 to 5 years, but 15% of households said that droughts only occur every 1 to 2 years. Furthermore, 7% of respondents stated that droughts occur every 6 to 10 years. (...) Similarly, FGDs and key informants were asked about the situation of drought occurrence for the last three decades in the study area, and most of them indicated that high frequency of drought was experienced in recent years, which was not familiar before, and it has negative effects on the livelihoods of pastoralists and agropastoralists in the study area. (...) Perception of households on the impact of climate change and variability is presented in Table 12. Pastoral households perceived the top five climate change effects as a decrease in crop yield, a decrease in livestock asset, a lack of water and food and a loss of income."
1	Exploring climate change trends in major river basins and its impact on the riverine ecology, fish catch and fisheries of the Peninsular region of India: issues and a brief overview	Panikkar, P.; Sarkar, U.K.; Das, B.K.	Journal of Water and Climate Change	2022	10.2166/wcc.2022.054	"As depicted in Figure 5, a very high perception exists in the fishing community of the Cauvery river basin about climate change observed in the last 10 years; 95% understand temperature and sea level are changing, 91% reported rainfall is changing and salinity also is increasing, 86% think extreme rainfall is affecting productivity and the groundwater level is changing as well. Surface water salinity increase by 73% is reported. Even though the monsoon period is shorter than the non-monsoon period, about 62.3% of the total fish catch in River Cauvery takes place during the monsoon. During the monsoon period, the increase in the fish catch can be attributed to the tapping of the breeding season. Usually, fishermen shift to shallow areas as the water level rises during the monsoon season. This indicates that they are tapping the breeding grounds of most of the fishes. The fishermen have attributed the increase in introduced fish catch to the reduction in turbidity during the monsoon season."
6	Social and ecological climate change vulnerability assessment in the Indus delta, Pakistan	Solangi, G.S.; Siyal, A.A.; Siyal, Z.-U.-A.; Siyal, P.; Panhwar, S.; Keerio, H.A.;	Water Practice and Technology	2022	10.2166/wpt.2022.087	"When asked about climate change indicators, 76.53% of respondents said temperature has risen in the past 20 years (Figure 4). However, 97.23% of respondents said there was a downward trend in rainfall. During the summer, however, 92.46% reported increased wind velocity. (...) According to the data, 92.4% of respondents agreed that the temperature has changed. However, 83.2% of respondents said their fish catch had decreased. While 9.2% indicated no change or a decline in fish catch as a result of temperature changes in the delta."

6	Changes in coastal farming systems in a changing climate in Bangladesh	Hasan, M.K.; Kumar, L.	Regional Environmental Change	2022	10.1007/s10113-022-01962-8	"The interviewed farmers mentioned why they had changed their farming systems, and their responses were classified into three categories, namely climate change (e.g., changes in temperature, rainfall, flood, drought, cyclone, or salinity), non-climatic factors (e.g., changes in market demand, price, or input unavailability), and unsure (when they could not decide on any of the climatic and non-climatic causes). Among the farmers, 64% perceived that climate change was responsible for their changes in farming systems (Fig. 5). There were 29% of the farmers who thought that they had changed their farming systems due to non-climatic factors. There were distinct spatial variations in the proportions of the farmers who claimed climate change to be responsible for their changes in farming systems. On average, higher percentages (M = 73%) of the farmers in the western coast, compared with 63% in the central coast and 41% in the eastern coast, believed that climate change had forced them to change their farming systems. The highest level of consensus of the causes of changes in farming systems was observed in Sarankhola (85%) while the lowest was in Teknaf (36%).(...) Awareness of climate change was substantially higher (49.1% compared with 21.8%) among the farmers who perceived that climate change had caused changes in their farming systems. Among the farmers in the "yes" perception group, 61.7% thought that temperature had increased, 52.5% stated that rainfall had not increased, and 39.6% mentioned that the frequency of cyclones had increased over the past 10 years compared with the decade before. The percentages of the farmers in the "no" perception group were lower in these cases."
2	Evolving farm-level adaptation to climate variability and change risks in the forest-savanna transitional zone of Ghana	Guodaar L.; Appiah D.O.	Environmental Challenges	2022	10.1016/j.envc.2022.100654	"The results show that majority (89%) of respondents have observed a decreasing rainfall intensity over the last couple of decades. The farmers further observed that not only has the intensity of rainfall reduced but also its frequency has been decreasing (94%) as well.(...) The respondents also observed that there has been a reduction in the frequency of floods (62.7%) in the study area. The reduction in flood frequencies was reflective since a reduction in rainfall frequency and intensity potential reduce flood events ceteris paribus. In relation to temperature, majority of respondents (95%) indicated their observation of increasing temperatures over the last two decades.(...) Also, majority (97%) of respondents observed intensity of droughts in their local environment.(...) Moreover, majority (91.7%) of respondents observed that the intensity and frequency of wind storms have been in_x0002_creasing in recent years.(...) The survey and focus group discussions results indicate that farmers have observed climatic changes in their local environment through manifestations of increased temperatures, decreased intensity and fre_x0002_quency of rainfall and floods, and intensified drought events. This means that farmers have a clear memory and understanding of the dynamics of their local environment, particularly in changing temperatures."
16	Indigenous perceptions and adaptive responses to the impacts of climate variability in the Sierra Nevada de Santa Marta, Colombia	Guáqueta-Solórzano V.-E.; Postigo J.C.	Frontiers in Climate	2022	10.3389/fclim.2022.910294	"The widest perceptions among Arhuaco communities were modifications in the weather regarding irregulardistribution of rainfall in the rainy season and unexpected high temperatures. The results of the surveys indicate that 98% of the adults perceived an increasing intensity of rainfall during May, and higher temperature throughout the year, although the latter was particularly severe during July. Perceptions were also specified in terms of climate variables (precipitation and temperature) in different years. 95% of the respondents perceived that precipitation changed most in 2010 and 2011. Similarly, 86% perceived that the greatest temperature change occurred in 2015. It is generally perceived that changes in climatic variability are multicausal. A group of causes was mainly associated with divine punishments because of the reduction of religious offerings and the deterioration of the forests. Sacred places have also been reduced and enclosed by the expanding agrarian frontier through palm plantations, livestock, and small farming on the southeast side of the reserve. Quantitative results show that around 75% of respondents attributed the variability to natural phenomena, 10% to the gods, and 15% to human activities. 4% claimed international policy as the changing cause since it harms the most vulnerable populations and favors large industries. (...) Climatic shifts also impact nontraditional crops. Most of the respondents (76%) perceived decreasing coffee production and attributed it to water stress during the summer (July), and pests such as the mealy louse (Planococcus ficus) and leafminer (Leucoptera coffeella)."
10	Smallholder farmers' behavioral preferences under the impact of climate change: A comparative analysis of two agricultural areas in China	Peng Y.; Xu Z.; Wei P.; Cheng L.	Frontiers in Earth Science	2022	10.3389/feart.2022.1010733	"In Henan Province: The mean score for climate change belief was 4.1, while the risk perception score was 4, which indicated that farmers were well aware of the reality of climate change, and were highly sensitive to its impacts. (….) In Inner Mongolia: The mean score for climate change belief was 4.01, while the risk perception score was 3.8. The results showed that they were highly sensitive to the impact of climate change. However, compared with the farmers in Henan, the farmers in Inner Mongolia had a weaker perception of climate change risk."
10	Observed climate trends, perceived impacts and community adaptation practices in Côte d'Ivoire	Kouassi J.-L.; Wandan N.; Mbow C.	Environmental and Socio-Economic Studies	2022	10.2478/environ-2022-0016	"The perception of farmers of the evolution of climate patterns in the study area over the last four decades is presented in Table 3. Most farmers (98.07%) perceived that the start of the rainy season in these ecoregions was very late. Besides, more than 98% of the farmers argued that the duration of the rainy season is reduced compared to previous years and the number of rainy days had decreased. In addition, 99.61% of the respondents highlighted that the early start of the dry season reduced the duration of the rainy season. With a longer duration of the dry season (98.84% of responses), most of the respondents were unanimous on the increase in the intensity of pockets of heat and drought. Most of the farmers (91.51%) experienced a decrease in the amount of rainfall in the landscape.(...) The perceptions of the causes of climate change are presented in Table 4. The farmers stated that the main causes of climate change observed in past decades were excessive deforestation (76.83%), natural variations in climate (50.93%) and wildfires (31.27%). Only 11.3% of farmers attributed the causes of climate deterioration to non-compliance with local norms and beliefs. In addition, about 10% of farmers indicated that the observed climate change was a divine will."
6	Integrated Farming Systems as an Adaptation Strategy to Climate Change: Case Studies from Diverse Agro-Climatic Zones of India	Paramesh V.; Kumar P.; Shamim M.; Ravisankar N.; Arunachalam V.; Nath A.J.; Mayekar T.; Singh R.; Prusty A.K.; Rajkumar R.S.; Panwar A.S.; Reddy V.K.; Pramanik M.; Das	Sustainability (Switzerland)	2022	10.3390/su141811629	"Most respondents perceived an increase in temperatures and the late onset of rainfall in all the surveyed locations. In the semi-arid zone, all the farmers perceived a temperature rise. Likewise, most of the IFS farmers in arid, sub-humid, and humid also perceived an increase in temperature over recent years. In addition, the farmers in arid, semi-arid, and sub-humid regions perceived the late onset of monsoon. The decrease in rainfall amount was perceived as higher by IFS farmers of the semi-arid region followed by arid, sub-humid, and humid zone (Table 3). In the humid region, farmers perceived that the rains that used to come evenly during the planting season in previous years have become more unpredictable, erratic, terminal heavy rains and also causing flood situations. In the arid, semi-arid, and sub-humid zone, the majority of the farmers' noted that the rain mainly started late and caused mid-season dry spells affecting crop growth and productivity. Farmers of all four ACZ's perceived an increased incidence of the dry spell. However, the higher dry spell perceived by IFS farmers were in the order of arid > sub-humid > semi-arid > humid regions.(....) The interviewed farmers also confirmed that hailstorms were common in the humid zone. According to the farmers, the number of storms had increased over time,resulting in flash floods that wash away their crops. (...) Most IFS farmers noticed changes in cropping patterns, increased pests, and diseases, and decreased availability of irrigation water, especially during winter and monsoon."
2	Perception of Cassava-Based Farmers to Climate Variability in the Rain Forest and Derived Savannah Biomes of Nigeria	Ayinde A.F.O.; Johnston P.A.; Olujimi O.O.; Dasgupta P.; Akerele D.	Sarhad Journal of Agriculture	2022	10.17582/journal.sja/2022/38.5.43.52	"Nonetheless, farmers' perception of climate variability shows an interesting fact that farmers, although not versed in the formal knowledge of climate change/ variability, can notice changes in weather parameters (especially rainfall and temperature) over the years with seeming agreement of views across the respondents interviewed in the study. Table 1 shows respondents' views of climate variability. Respondents generally perceived rain as highly unpredictable over the years, although farmers have come to live with these rainfall fluctuations. (...) As expected, farmers had observed the irregularity of rainfall, at least in the last ten years. They observed rains no longer commence at the expected onset towards the end of March in Abeokuta, Ogun State and in Ilorin, Kwara State. This makes it difficult to target the early period of planting by cassava-based farmers. This incapability to take accurate decisions on planting dates imposes perceived risks of yield loss on the farmers. Many farmers therefore, have resorted to planting sequentially (vary planting time for the same crop within the year) to minimize revenue loss.(...) Farmers also reported high temperature (Table 1) and drying up of rivers and streams for some of the years, which negatively affected the availability of water for optimum growth of the crops.
12	Artisanal fishers in small island developing states and their perception of environmental change: the case study of Mauritius	Appadoo C.; Sultan R.; Simier M.; Tandrayen-Ragoobur V.; Capello M.	Reviews in Fish Biology and Fisheries	2022	10.1007/s11160-022-09735-6	"Fishers showed a pronounced agreement (89.2%) (Table 1) that there is a change in rainfall pattern and distribution over the last 10–15 years. They reported that the frequency of torrential rain over the past 15 year is higher nowadays relative to 10–15 years ago (68.1%). There was also a general agreement that fish abundance is lower in winter (83.5%). However, in case of summer, there does not appear to be an agreement (less: 53.1%, more: 46.9%). Finally, 81.6% of fshers reported that there are less fsh species now compared to 10 to 15 years ago."

10	Smallholder farmers' perceptions and adaptation strategies to climate change risks in northwest Ethiopia	Likinaw A.; Bewket W.; Alemayehu A.	International Journal of Climate Change Strategies and Management	2022	10.1108/IJCCSM-01-2022-0001	"The result indicates that the majority of households in the study area believed that the temperature and rainfall had increased and decreased, respectively, in the previous years. In Lay Gayint, Tach Gayint and Simada, respectively, 91%, 93% and 95% of households reported an increase in temperature. On the other hand, 73%, 81% and 86% in Lay Gayint, Tach Gayint and Simada, respectively, believed that rainfall was decreasing (Figures 2 and 3). According to the findings of the FGDs and KIIs, households specifically reported temperature and rainfall variability, an increase in minimum (nighttime) and maximum (daytime) temperatures and a decrease in Belg rainfall (the minor rainy season). As a result, it has been found that households' perceptions of climate variability and trends are consistent with variations in minimum and maximum temperatures as well as rainfall in the Belg season.(...) Tables 4–6 show climate change risk perceptions of households in the study area. It is shown that in the Lay Gayint district, the likelihood of the occurrence of potentially dangerous climate change risks is most likely to be linked to persistent drought, delayed onset of rainfall, early termination of rainfall and food insecurity as reported by households (Table 4). As shown in Table 5, households in the Tach Gayint district perceived recurrent drought, food insecurity, delayed onset of rainfall and early termination of rainfall as potentially dangerous climate change risks. Moreover, recurrent drought, food insecurity, delayed onset of rainfall and early termination of rainfall were perceived as the major potentially dangerous climate change risks by households in Simada district (Table 6). The variation of CCRPI for each climate event implies that households have heterogeneous perceptions of risk arising from the different climate events, which could be associated with the variations in socio-demographic and external factors. (...) Households living in Simada (Woyna Dega agroecology) and Tach Gayint (Dega agroecology) perceived more climate change risks than households in Lay Gayint (High Dega agroecology). This could be associated with the probability of the incidence of potentially dangerous climate change risks in the area."
2	Rural households' perception of climate change in the Central and North Gondar Zones, Northwest Ethiopia	Awoke W.; Agitew G.	African Journal of Food, Agriculture, Nutrition and Developme	2022	10.18697/ajfand.113.19400	"As shown in Table 4, 57%, 19%, 7% and 17% of the respondents said that temperature was increasing, decreasing, no change and fluctuating, respectively. More than half of the respondents said that the temperature was increasing.(…) Results from key informants and FGDs revealed that there was extreme cold temperature starting mid-October up to the end of January and hotness, especially during April. The respondents said that rainfall was increasing (25.4%), decreasing (36.2%), not changing (5.4%) and fluctuating (33.1%). The majority of respondents perceived that climate change was decreasing.(...) Respondents perceived flood as increasing (36.9%), decreasing (23.8%), not changing (15.4%) and fluctuating (23.8%). Regarding frost, respondents perceived it as increasing (60.8%), decreasing (16.9%), not changing (3.1%) and fluctuating (19.2%) with different percentage levels. In addition, the respondents perceived drought as increasing (58.5%), decreasing (13.8%), no change (12.3%) and fluctuating (15.4%). Generally, respondents perceived that temperature, flood, drought and frost were increasing from day to day with decreasing trend of rainfall."
10	Smallholder farmers' perception of climate change and choice of adaptation strategies in East Hararghe Zone, Eastern Ethiopia	Zeleke T.; Beyene F.; Deressa T.; Yousuf J.; Kebede T.	International Journal of Climate Change Strategies	2022	10.1108/IJCCSM-01-2022-0014	"Respondents were asked if they had perceived any significant changes in temperature and rainfall for the last 20 and above years to assess farmers' perception of climate change. The result presented in Table 3 indicated that 97% of sample respondents perceived that temperature was increasing and 99% of them perceived a decreasing trend in rainfall.
10	Effect of indigenous and scientific forecasts on pastoralists' climate change perceptions in the Rwenzori region, Western Uganda	Nkuba M.R.; Chanda R.; Mmopelwa G.; Kato E.; Najjingo Mangheni M.;	Climate and Development	2022	10.1080/17565529.2022.2119831	"The results show that the use of both IFs and SFs or IFs only has a positive effect on climate change perceptions for pastoralists (Tables 6 and 7). Pastoralists using IFs only for seasonal forecasts were more likely to perceive flood increase by 27%. Pastoralists take note of historical flood trends using their indigenous knowledge. Pastoralists using both forecasts for cessation were more likely to perceive a flood increase by 51% and a drought increase by 54%. There are peculiarities in the effect of forecast use on climate change perceptions. Pastoralists using both forecasts for onset were less likely to perceive a flood increase by 47% and a drought increase by 53% (Table 7)."
1	Does climate knowledge act as a shield for farm livelihoods? Empirical analysis from the coastal and non-coastal ecosystems of India	Das, U; Ansari, MA; Ghosh, S	Theoretical and Applied Climatology	2022	10.1007/s00704-022-04245-8	"The climate knowledge of farmers of the coastal district of Kendrapara is presented in Table 1. (...) More than 50% of the farmers were fully aware of the contribution of electronic appliances to climate change and the seasonality shift in many crops due to climate change in the past 10–15 years. Three knowledge items, viz. climate change both natural and man-made, negative impact of stubble burning by farmers on climate, and improper dumping and burning of household and farm waste causing climate change, evoked a response of partially known from more than half of the sampled respondents. It is evident that majority of the respondents were unknown about greenhouse gases (GHGs) causing climate change, and two major sources releasing GHGs. The average overall climate knowledge score was 10.62 with a deviation of 4.87. Table 2 presents the climate knowledge of farmers of non-coastal district of Dhenkanal. Only knowledge item no. 5 evoked a response of completely known from more than half of the population. While four knowledge items, viz. greenhouse gases causing climate change, two major sources releasing GHGs, increased carbon dioxide catalyzing the process of climate change, and sea level rise due to climate change, evoked a response unknown from more than half of the population, and only three knowledge items, namely, climate change both natural and man-made, improper dumping and burning of household and farm waste causing climate change, and burning of fossil fuels causing climate change, were partially known by more than half of the sample respondents. The average overall climate knowledge score was 8.79 with a devia_x0002_tion of 4.92. (...) For both the districts, crop + livestock farmers had higher climate knowledge level i.e., 69.75% and 67.75%, respectively."
27	Climate Change Impacts Can Be Differentially Perceived Across Time Scales: A Study Among the Tuareg of the Algerian Sahara	Miara MD, Negadi M, Tabak S, Bendif H, Dahmani W, Ait Hammou M, Sahnoun T, Snorek J, Porcher V, Reyes-García V, Teixidor-Toneu I.	Geohealth	2022	10.1029/2022GH000620	"Changes in elements of the atmospheric system, including a higher cloud cover, colder temperature, a delay in the start of the cold and the hot seasons, less wind, sandstorm intensity, and rain were mentioned by informants. In particular, respondents mentioned that the fight against drought is increasingly difficult as digging deeper and new wells or rationing the use of water become less effective in provisioning it. Some local community members, but not all, also mentioned changes in the physical system around them that were directly linked to climate change, especially a decrease in the river's volume. The Tuareg also reported changes in abundance of local fauna and flora, including increased presence of invasive species.Interestingly, although the visual analysis of Figure 3 suggests that floods (a sign of water abundance among the Tuareg) were more abundant before the 1970 s, and have only happened twice since then, a decrease in the number of flood events was not mentioned by the Tuareg as one of local indicators of climate change impact.Similarly, informants did not mention that drought and drought-related events are more common in recent times, although this trend is evidenced from the community timeline. In contrast, two of the indicators of climate change impacts mentioned directly relate to temporal seasonal shifts of the hot and cold season and, in particular, to the seasonality of the rainy periods (Figures 4 and 5). The Tuareg have noticed a shift in the cold season and its associated rainy period, which has shifted from mid-December to mid-February in the past to early February-late March in the present. Informants also reported that the rainy period of the hot season had shifted from May–August to August–October (Figure 4). This change has a direct impact on agricultural activities, specifically shifting the moment when wheat is shown and thus shortening the wheat growing season (from October–May to February–May; Figure 4). Despite the reported changes in climate and environment, the Tuareg mentioned that other cultural and livelihood activities are carried out at the same times as in the past. Some informants believe that the present is a temporary challenging period due to "God's wrath" and pray that climatic and ecological conditions will soon revert to their former state. However, inform_x0002_ants told us that the number of pastoralists and herds has decreased, as many people have decided to settle down, transitioning into sedentary or semi-sedentary pastoral or non-pastoral lifestyles. Sedentary or semi-sedentary Tuareg rely on agricultural activities to a larger extent than nomadic pastoralists."
3	Climate Change Impact on Indigenous Food Resources	Rankoana, S.A.	International Journal of Social Science Research and Review	2022	10.47814/ijssrr.v5i10.713	"Participants identified extreme heat and less and unpredictable rainfall as remarkable manifestations of climate change responsible for depletion of indigenous food resources. Participants reported increased temperature as a deadliest weather-related hazard. It was cited as compromising the community livelihood. Fifty participant described how extreme heat had caused decrease in crop production. Extreme weather events like storms and floods, and their increasing unpredictability, pose direct and indirect threats to the health of the community as the crops wither, biodiversity depletes leading to death of livestock as a result of lack of fodder.)....) Drought was reported as the most common climate-related disaster. It presents a risk to human health by increasing exposure to reduced water quality and quantity, and diminished food resources. Drought has devastating consequences on the community indigenous food resources such as subsistence production of crops and livestock, and collection of vegetables in the wild.(...) The obvious change in climatic conditions reported by participants in the recent years is the rising temperature and unpredictable rainfall."

3	Small-holder farmers knowledge and information on the impact of climate variability & extremes on livestock production in Limpopo & Mpumalanga Provinces.	Nesamvuni, A. E.; Ndwambi, K.; Tshikolomo, K. A; Lekalakala, G. R.; Raphulu, T.; Petja, B. M.; Van Niekerk, J.	Technium Social Sciences Journal	2022	10.47577/tssj.v27i1.5299	"Almost all the farmers (96.17%) have heard about CC but only a few (3.83%). (…) The farmers who were familiar with the concept of CC, provided where they learned about this subject. Based on the information presented in Table 1, multiple stakeholders capacitated farmers with CC information. Unexpectedly, almost all livestock farmers (98.58%) have not heard about this topic from the government. (...) On the other end of the spectrum, radio was the most imperative medium for the conveyance of the CC information. Almost all farmers (94.32%) receive CC-related information through this medium. (...) Newspaper and, television was also efficient mediums in the conveyance of this information, each with the outreach of 16.76% 32.67% respectively. Very few farmers (6.82%) heard about CC from their friends. The contribution of the NGO's and churches was close to nothing, the two contributed a little less than 1% and 1.99% respectively. A low figure of 4.26% heard this topic at the village meetings. (...) Table 2 portrays the beliefs of small-holder farmers on factors that influence Climate Change. The majority of the farmers (77.87%) expressed a dip in rainfall quantity and frequency as the major visual evidence to the down of CC. (...) Beyond the scope of CC at a generalized level, the farmers expressed some of the impacts of CC that are experienced in their communities. The visual impacts of the CC that are experienced within the localities of the farmers are indicated in Table 2. The majority (80.87%) outlined that the most imperative predicament that is correlated to CC is the drought.(...) Table 3 shows the frequencies and respective percentages of small-holder farmers and their perception of changes that may be due to climate change. The rest showed that the farmers did not correlate the occurrence of the following climatic phenomena to the CC; tropical cyclones/ wind change, land erosion and degradation, destruction of buildings and, unpredictable seasons. The following percentile of the farmers indicated that each of these factors does not conform to the CC; tropical cyclones 95.63%, land erosion/degradation 93.17%, destruction of buildings 98.91 and Unpredictable seasons (short or long rainy season) 96.17%. While these factors are primal correlated with CC, especially in South Africa."
16	Associating farmers' perception of climate change and variability with historical climate data	Ezeh, J. O.; Madukwe, E. U.; Ezeh, C. U.	Journal of Agricultural Sciences	2022	10.2298/JAS2203299E	"More than half of the respondents claim to be aware of climate change while 24% say that they do not know about climate change. They assert that they have heard of climate change, however, over 58% of the respondents lack a scientific understanding of what climate change is. Most of the farmers have no idea of the causes of climate change, as claimed by 81% of the respondents, while 16% attribute it to cosmological powers or the 'Gods'. On the perceived changes in rainfall over time, 95% of the respondents say that they have observed changes in the rainfall of the area. Of these, over 59% show they have observed increasing rainfall and polluted rain, 54%, and 52% have observed a delayed onset of the rainy season and erratic or irregular rainfall, respectively (Table 1).(....) Over 94% of the respondents observed changes in temperature over time in the area, while a little over 5% did not observe a temperature change. Similarly, about 99.7% of these observed rising temperatures (Table 4).(...) The farmers are aware of the change happening to their environment, but none of them could mention the causes of climate change. A few, however, attributed it to the wrath of the 'Gods'. (...) The perception of the farmers is that there are notable changes in rainfall intensity, delay in the onset of the rainy season, and erratic rainfall.(...) The perception of temperature in the area is that it is increasing. The FGD and key informant interview support this view."
3	Farmers' perceptions of climate change, long-term variability and trends in rainfall in Apac district, northern Uganda	Atube, F.; Malinga, G.M.; Nyeko, M.; Okello, D.M.; Mugonola, B.; Omony, G.W.; Okello-Uma, I.	CABI Agriculture and Bioscience	2022	10.1186/s43170-022-00116-4	"Farmers generally perceived climate change in terms of extreme weather events, number of pest and disease attacks, availability of rainwater, the intensity of rain, number of rain days, duration of rain period, amount of rain, frequency of rain, variation in the onset of rain period, variation in cessation of rain period and the number of hot days/drought. Te results of the study showed that almost 88% representing 232 farmers/respondents interviewed across the district perceived an increase. In comparison, only 6% perceived a decrease in the number of hot days/droughts over the past three decades (Table 1). A total of 6% of farmers perceived no change in hot days. Te majority of respondents perceived an increased number of pest and disease attacks (86%), an increased number of extreme weather events (72%), while 47% reported increased variation in the onset of rain period. Te majority of respondents reported a decrease in the number of rain days (88%), frequency of rain (87%), amount of rain (87%), the intensity of rain (82%), availability of rainwater (79%), duration of rain period (76%), (Table 1). Only a few (between 5 to 14%) farmers reported no change in climate for the past three decades. Te results of this study imply that farmers perceive a change in climate, as most (>80% of the farmers) interviewed perceived a decreasing trend in the amount and intensity of precipitation.
2	Misalignment of perceptions with records and resources for responding to climate change risk	Kannan, S.; Bessette, D.L.; Abidoye, B.	Frontiers in Climate	2022	10.3389/fclim.2022.1038320	"The vast majority, i.e., 90 percent, of farmers reported observing a long-term change in temperature, and 83.8 percent of farmers reported observing a long-term change in rainfall."
31	Knowledge of climate change and adaptation by smallholder farmers: evidence from southern Ethiopia	Belay A.; Oludhe C.; Mirzabaev A.; Recha J.W.; Berhane Z.; Osano P.M.; Demissie T.; Olaka L.A.; Solomon D.	Heliyon	2022	10.1016/j.heliyon.2022.e12089	"The results indicated that most farmers who participated in FGD identified climate change as something which is already happening and described its negative impacts on their farming activities. (…) The KII from Lemisuticho Kebele who lived in the area for close to 35 years reported as indicated that 20 years ago, the amount of rainfall used to have a relatively normal pattern and it was sufficient for planting. However, in the recent decade, the duration and number of rainy seasons like what an Amharic speaker would call "belg" (small rainy season) and "meher" (harvesting season) season had declined and followed erratic nature of patterns. Regarding temperature change, a key informant reported that temperature has increased compared with the last two decades. Moreover, owing to temperature increment, several water springs have dried out, and even the amount of water in local rivers became too small when compared with that in the last two decades. Many respondents (81.8%) perceived that reported that to the best of their understanding, climate condition has changed since the last three decades. Similarly, 71.95% farmers reported that the temperature has increased, and 53.15% of them reported that the amount of rainfall has decreased (Table 2). A farmer in KII participation explained that within the last 5–10 years, the rainfall pattern became unpredictable and had short duration with either early or late onset rainy seasons. Meanwhile, frequency of dry spells and extended droughts has increased. (...) The result indicated that (81.8%) of the respondents have perceived increasing temperature and decreasing rainfall distribution in the last three decades, particularly in the recent 5–10 years. Farmers reported that drought, extreme flooding, pest, and disease are the main climate change-related problems in the area. (...) Survey participants reported the main changes in rainfall and tem_x0002_perature observed in their localities; 71% of respondents claimed that the rainfall and temperature trends become increasingly unpredictable."
20	Livestock farmers' perception of climate change and adaptation strategies in the Gera district, Jimma zone, Oromia Regional state, southwest Ethiopia	Abazinab H.; Duguma B.; Muleta E.	Heliyon	2022	10.1016/j.heliyon.2022.e12200	"There was no significant difference ($p < 0.05$) in farmers' perception of climate change and causes, and rainfall and temperature trends between climatic zones. Overall, majority (79.2%) of respondents perceived CC over the last 20 years, while 20.8% of interviewees perceived climate variability (irregular) pattern. The majority (84.9%) of respondents perceived an increase in temperature over the last two de_x0002_cades, while about 4.9%, 7.3% and 2.9% perceived a decrease, no change and did not know, respectively. (...) Similar results were also reported from FGDs confirming farmers' perception of increase in temperature and decrease in rainfall over the past 20 years. They stated that there has been a variable and erratic rainfall with decline in amount and increase in temperature over the last two decades. They mentioned that temperature has become hotter and drier, and number of hot days increased and coldness during night times decreased. They also experienced variation in amount, distribution, timing and duration (months) of rainfall with less, irregular, early onset and early exit of rainy season, scattered and shorter rainy periods. They further mentioned crop planting periods have changed in their area with late start of crops cultivation becoming common due to CC, resulting in reduced crop yield and food insecurity. They also stated that the increasing temperature anddecreasing rainfall affected the growth, maturity, quality and quantity of natural pasture, resulting in feed shortage, particularly during the long dry season. They further mentioned that anthropogenic activities such as deforestation and natural processes as possible causes of CC. Generally, the results indicate that interviewed and FGD farmers in the current study area had good knowledge of CC, which is a basic prerequisite for adaptation. In this study, livestock farmers attributed CC to different causes such as anthropogenic activity and natural processes (47.2%), anthropogenic activity (28.2 %), natural processes (12.7 %), and God's anger due to human sins (11.9) for the perceived changes in rainfall and temperature trends. The anthropogenic action was related mainly to deforestation for the purpose of crop land expansion, construction and source of fuel wood, and was attributed to population growth. During FGDs, participants indicated similar causes of CC as results from the questionnaire interview."

6	Climate Change Perceptions and Adaptation Strategies: A Mixed Methods Study with Subsistence Farmers in Rural Peru	Landaverde R.; Rodriguez M.T.; Niewoehner-Green J.; Kitchel T.; Chuquillanqui J.	Sustainability (Switzerland)	2022	10.3390/su142316015	"Even though Peruvian meteorological information report changes in the local weather behavior over the last ten years, a small group of respondents (n = 10) did not believe CC is happening in the study location. Even though most respondents acknowledged CC occurrence, the interviews surfaced they did not know how to define it, even when they perceived it. When farmers were asked during the interviews to define CC, responses were "No, I think I cannot do it", "I do not know what it is", or simply "That, I don't know" Other respondents, however, had a non-technical definition: "I think it is everything that changes in the weather" (Female farmer, 67 years). "Perhaps it would be that . . . there are years that are hotter than others, and also with more or less rain" (Male farmer, 29 years). "I wouldn't know how to define what climate change is . . . Interviewer: Okay, but do you perceive changes in the weather, for example, in tempera_x0002_ture or precipitation? Perhaps, droughts here in the community? Yes, of course . . . it doesn't rain enough anymore . . . or at least not in this area. What happens is that it rains a lot in a few days, but then it stops raining for a long time, and then we do not have water to do anything" (Male farmer, 53 years). ber of rainy days during a year, with 60.1% perceiving a substantial decrease (Figure 1). Connected with all the precipitation variability, it is not surprising that farmers found predicting the rainy season behavior more challenging. Around 74% of the subsistence farmers felt that raining season beginning has become less predictable. Similarly, precipitation variability is associated with drought events. In the last ten years, 62.1% of participants perceived an increase in the incidence of drought events, and 60.1% perceived the drought events duration had also substantially increased (Figure 2). Overall, interviews revealed that subsistence farmers not only perceived changes in droughts incidence and duration but also recognized the effects that are causing in their agricultural production.(...) About 38.8% of the respondents indicated the maximum temperature had increased substantially, while 16.5 and 21.2% perceived a steady and decreasing temperature, re_x0002_spectively. Then, 44.6% perceived the minimum temperature had increased, while only 21.3% affirmed it had not changed, and 6.7% had noticed a substantial decrease (Figure 3). The interviews indicated that the differences in temperature between seasons are no longer easily perceived, and temperatures are constantly rising. (....) One of the major features of CC is the incidence of extreme weather events. Farmers were presented with five events: extreme hot days, extreme cold days, extreme rainy days, extreme drought, and floods. Extreme hot (65%) and cold days (58.2%) were the events that, according to most farmers, had increased substantially. Conversely, flooding was the extreme event with the lowest percentage of responses identifying a substantial increase (Figure 4). Finally, most subsistence farmers (88%) perceived local natural resources (e.g., forests, water, and soil) would likely be affected by CC. Perceptions were similar regarding the likelihood of CC affecting livestock, water resources, and minor crops for 90% of respondents."
2	Understanding Multidirectional Climate Change Impacts on Local Livelihoods through the Lens of Local Ecological Knowledge: A Study in Western Amazonia	Estevo M.D.O.; Junqueira A.B.; Reyes-García V.; Campos-Silva J.V.	Society and Natural Resources	2022	10.1080/08941920.2022.2153294	"During semi-structured interviews and FGD, respondents mentioned 477 reports of cli_x0002_mate-driven changes (hereafter "observations"), which were classified into 53 Local Indicators of Climate Change Impacts (LICCIs). More than one third (n ¼ 183; 38.5%) of those observations referred to changes in elements of the atmospheric system, including changes in temperature (e.g., "today is hotter than in the past") and in rainfall (e.g., "nowadays, we have more rainfall during the summer"). Changes in elements of the physical system were mentioned 126 times (26.5%), including seasonal changes in the river water level (e.g., "the river level now is much lower during the dry season"), changes in the intensity of sedimentation of the river or lakes (e.g., "large floods are depositing a lot of soil in the v_x0001_arzea [floodplains]"), and changes in the speed of sea_x0002_sonal fluctuation in the river water level (e.g., "the river now rises faster"). Changes in elements of the human system were mentioned 89 times (18.5%), referring mostly to changes in crop mortality or productivity (e.g., "manioc is dying more now"), and changes in the incidence of human diseases (e.g., "we get more flu because of this strong heat"). Changes in elements of the biological system were mentioned 79 times (16.5%), and included changes in the mortality of wild plants (e.g., "the aterro [sedi_x0002_ment] brought by the floods is killing all the andiroba trees"), changes in the abundance of freshwater fish (e.g., "there is less fish now"), and changes in vegetation dynamics (e.g., "the v_x0001_arzea forest is getting denser now"; Table 1; see full LICCI list in Table S2 in Supplementary Information)."
2	Climate Variability Patterns and Farmers' Perceptions of Its Impact on Food Production: A Case Study of the Gelda Watershed in the Lake Tana Basin in Northwest Ethiopia	Anteneh M.	Air, Soil and Water Research	2022	10.1177/11786221221135093	"Farmers in the study area understand and express climate variability in terms of erratic rainfall distribution, decreasing amount, and increasing temperature over the three decades studied, according to the results of our household survey. Almost 88% of respondents believed that the temperature had risen over the 30-year study period, while only 4% disagreed. Other responses were provided by 8% of respondents (Figure 4). In terms of rainfall patterns, the majority of respondents (80%) reported a decreasing trend, 10% reported an increasing trend, and 7% reported no changes in the amount of rainfall in the catchment (Figure 4). According to the findings, farmers in the study area are well aware of climate variability and change, with the majority (88%) noticing an increase in temperature and a decrease in rainfall amount.(...) Farmers also reported that the rainy season used to begin in May, but that it has now shifted to mid-June or the beginning of July. During the focus group discussions, farmers in all areas of the catchment revealed that in the past, they had received a large amount of rainfall in late November, signaling the start of the catchment's small rainy season. Local farmers have also expressed concern about the unpredictability of the seasons. According to them, the beginning and end of the rainy season are becoming highly variable and completely different from what they used to be over the last 20 or so years. (...) Farmers also reported that the main rainy season, which used to last 4months in the last 20 years or so, has now been reduced to 2months, primarily in July and August. Rainfall distribution has become uneven and erratic, making it unsuit_x0002_able for long maturing crops such as maize, barely, finger millet, Niger seed, and potato. As a result, in the past, people could have seen their farmland covered with fully sprouted crops until mid-July and well vegetated crops until August 22 (Teka et al., 2012). However, the rains that normally began in mid_x0002_June shifted to July and ended much earlier (mid-September) in a way that had never been seen before. Participants in the focus groups explained that in the past, rainfall distribution over the season was normal and they could manage to plan their agricultural activities (eg, sowing, planting, harvesting) properly and effectively, knowing when to expect significant dry and wet spells. Participants in the focus group discussions also noted that farmers were now confronted with increasing spatial rainfall variation, with some areas receiving evenly distributed rainfall while neighboring areas received inconsistent rainfall. This variation affects the planting season of some crops and even the amount of crop production. (...) The household survey data revealed that farmers' perceptions of the causes of climate variability differed. According to Table 5, 89.6% of respondents named deforestation as a contributing cause of climate variability, while 78% blamed intensified agriculture for climate variability in their communities. On the other hand, approximately 92.3% of respondents cited popula_x0002_tion pressure as the primary cause of climate variability. About 32.3% of respondents cited soil degradation and erosion as causes of climate variability."
1	Climate change and the Western Himalayan community: Exploring the local perspective through food choices	Das, S; Mishra, AJ	Ambio	2022	10.1007/s13280-022-01810-3	"The evidence suggests that communities' opinion about changing climate is significantly affected by the region's fluctuating temperature, i.e., cool and warm years of the region (Donner and McDaniels 2013; Bauerfeind and Fis_x0002_cher 2014). For example, the precipitation in the lowland district has decreased; the respondents in the Haridwar district defined climate change in terms of temperature and rainfall patterns in recent decades. The rainfall pattern is no more the same as it used to be in the early 2000s. In the early decades in the plane region, it used to rain heavily, but now a decline in rainfall has been observed. It is erratic and scanty nowadays. Similarly, now it is too hot to go outside during summer. Summer is not suitable for health due to harmful rays. (a 46-years old female). (...) The variability in snowfall and rainfall has increased with time and is not constant now. Similarly, the villagers in Tehri Garhwal districts associated the concept of climate change with decreased snowfall, increased rainfall, and loss of local plant varieties. Earlier, there used to be heavy snowfall in my region, but the incidence of snowfall has decreased with the passage of time. Besides, sometimes the rainfall is heavy, and sometimes it is low. For me, this is the definition of climate change. (a 49-year old male). (...) Hence, the notion of climate change is being shaped by the availability of region_x0002_specific plant species. For example, the villagers in the Dehradun district explained climatic variabilities in terms of loss of vegetation besides other factors like high temperature and lesser rainfall. The region used to be heavily covered with green vegetation and trees. Similarly, the respondents of the Almora district defined climate change with the notion of dietary shifts. (....) When asked the same question from the villagers about climate change, they correlated the change in climate with natural disasters like frequent cloudbursts, landslides, and forest fires. We used to consume the juice of the local flower for our daily needs. But, the increased incidence of forest fires has drastically affected production. (61-year old female). (...) The changing patterns of rainfall, snowfall, and irregular precipitation patterns, i.e., fluctuating temperature, are the modes of direct observations in the climate and have been incorporated into the standard definition of climate change. Nevertheless, there is a contextual meaning of climate change as acknowledged by local respondents, which acts as proof of climate change, for example, atmospheric, ecological, and biological indicators (Table 4). The atmospheric indicators can be observed in the change in the sky and clouds' colors, which also helps predict wind direction; ultimately, the fluctuation is observed as a long-term trend. Similarly, the ecological indicators can be the direction of river streams, landslides, and forest fires, which affects the local ecosystem and eventually results in the retreat of glaciers' rise in sea level as an indication of climate change.(...) Moreover, 89.5% of respondents agreed on climate change, and 7.6% disagreed that climate change is the reality of modern times. Additionally, when the questions related to indicators of climate change were asked, 85.2% agreed, 6.2% disagreed with unpredictable rainfall patterns, 80.0% agreed, 3.8% disagreed with unstable temperature change, 90.5 agreed, and 6.2 disagreed with delayed seasonal change. Further, regarding the impact of climatic variabilities, namely, change in land-use pattern, 93.4% agreed, and 2.4% agreed; shifting cropping pattern, 59.5% agreed, and 13.3% disagreed. Similarly, on the negative impact on biodiversity, 75.7% agreed, 7.1% disagreed impact on local food choices, 73.4% agreed, and 11.9 disagreed."

1	Impacts of Climate Change on the Lives of Riverine Farmers on the Lower Rio Negro, Amazon	de Vasconcelos, MA; Pereira, HD; Lopes, M; Guimaraes, DFD	Atmosphere	2022	10.3390/atmos13111906	"Regarding the changes in the seasonality of the Negro River, about the extremes of flood and ebb, most of the interviewees believe that they are within the normal range, whether the large floods or large ebbs (Figure 9). About a third of community members believe that extreme floods and ebbs have occurred more frequently. Less than a fifth of those interviewed disagreed and believed that there was a reduction in extreme events. members were asked about the behavior of rain and heat, that is, whether these climatological parameters are within the normal range or are changing (Figure 10). About the rain events being different, the vast majority responded positively. However, a quarter of respondents believe that the rains are normal. More than half believe that it has rained less, a quarter thinks that the rains are still normal, and the rest said it is raining more frequently. Concerning heat, all said that the event has changed. "
3	Climate Change Awareness and Indigenous Knowledge Systems and Practices (Iksp) of Riverine Fishers in the Nabaoy River, Malay, Aklan, Philippines: Linking Local Social Capital to Socio-Ecological Resilience Amidst the Changing Environment and Climate	Maliao, R. J.; Cahilig, R. C.; Cahilig, R. R.; Jaspe, B. T.	Malay, Aklan, Philippines: Linking Local Social Capital to Socio-Ecological Resilience	2022	10.2139/ssrn.4034376	"The majority (98%) of the respondents claimed that CC was happening. This can be summarized into two interrelated phenomena: extreme heat and rain (86%), and unpredictable weather (14%). These observations by the local fishers in Aklan were consistent with actual meteorological data in the region (Figure 2). (...) Only 63% claimed to know what causes CC, which was significantly higher than those who did not (37%) (X2, p=0.008). The most cited causative factor of CC by 45% of the respondents was anthropogenic, particularly the increasing human population (Figure 4). (...) CC knowledge was acquired primarily by 60% of the respondents from their personal experience (Figure 4). The respondents perceived homogeneously that CC was causing 1) extreme dry season, resulting in 2) potable water shortage and 3) low water level during the summer months, 4) stronger rains causing 5) extreme flooding, 6) fisheries decline, and 7) increase in human ailments (Figure 5).
6	Trends of rainfall onset, cessation, and length of growing season in northern ghana: Comparing the rain gauge, satellite, and farmer's perceptions	Atiah, W.A.; Muthoni, F.K.; Kotu, B.; Kizito, F.; Amekudzi, L.K.	Atmosphere	2021	10.3390/atmos12121674	"Farmers' perceptions are shaped mainly by short-term variability of climate parameters and the frequency of extreme events than slow long-term changes in the average conditions. (...) Over 95% of the UWR and UER region farmers reported late-onset dates of the rainy season. However, responses were more divergent in the NR, where 76% and 16% of farmers reported early and late-onset dates, respectively. A total of 248 (62%) and 134 (33%) of farmers reported late and early onset of the rains, respectively. In contrast, over 80% of farmers in UWR and UER reported early cessation of rainfall. Farmers' experiences on the cessation of rains in NR were split between early (49%), late (41%), and no change (11%). The regional aggregates showed that a total of 288 (72%) and 86 (22%) farmers reported early and late cessation of rain, respectively. (...) Evidently, 79% of farmers identified the timing of the onset of rains as a crucial determinant of the crop yield.
2	Assessment of farm households' perception, beliefs and attitude toward climatic risks: A case study of rural Vietnam	Nguyen-Thi-Lan, H.; Fahad, S.; Nguyen-Anh, T.; Tran-Thi-Thu H.; Nguyen-Hong, C.;	PLoS ONE	2021	10.1371/journal.pone.0258598	"Table 3 shows that farmers in the northern mountains of Vietnam are most concerned about the increase in soil erosion and washout, followed by the stress of prolonging dry season and drought. (...) A large number of farm households showed strong agreement that changes in the weather are damaging their household's production and activities (79.6% and 73.5%)".
6	Assessing farmers' typologies of perception for adopting sustainable adaptation strategies in bangladesh	Islam, A.R.M.T.; Hasanuzzaman, M.; Jaman, M.; Alam E.; Mallick J.; Monirul Alam G.M; Sattar, M.A.; Techato, K.	Climate	2021	10.3390/cli9120167	"According to the attitudinal statements, they were categorized based on each factor as: (1) Awareness of climate change, (2) Perceived risk, and (3) Environmental value. Factor 1 explained 35.021% of the variance (awareness of climate change), factor 2 elucidated 17.498% of the variance (perceived risk), and factor 3 explained 6.472% of the variance (environmental value). (...) 'Ecocentric' indicates that this class of people had a high perceived high environmental value with a low sense of awareness of climatic knowledge and perceived risk. (...) The farmers in the 'Ecocentric' category have much more concern about environmental values. So, they are likely to take measures to prevent the causes of climate change. On the other hand, the 'Worried' category exhibited the farmers with contrary perspectives in the other clusters representing the highest sense of perceived risk that can negatively affect many regions of the world. The 'Worried' (Cluster 2) farmers have less interest in environmental values, as they have the most interest in perceived risk, which suggests a lower likelihood to adopt sustainable practices. They focus on which negative consequences occur due to climate change. (...) Farmers in the "Anthropocentric" category are driven by the coupling of awareness of climate change and environmental value, which belong to cluster 3. They focus on which natural and manmade issues influence climate change.
2	Indigenous and conventional climate-knowledge for enhanced farmers' adaptation to climate variability in the semi-arid agro-ecologies of Kenya	Mugi-Ngenga E.W.; Kiboi M.N.; Mucheru-Muna M.W.; Mugwe J.N.; Mairura F.S.; Mugendi D.N.; Ngetich F.K.	Environmental Challenges	2021	10.1016/j.envc.2021.100355	"Majority of the respondents applied various indigenous indicators in weather forecasting (91% in Tharaka South and 97% in Kitui Central). These included observing the behavior of trees, animals, the sky, the moon, and the wind. (...) There was a significant association between observation of the sky (x2 = 14.631, p < 0.001), moon (x2 = 7.851, p = 0.005), and wind (x2 = 5.864, p = 0.015) in the two sub-counties. Farmers in Kitui Central used the sky, moon, and wind patterns more than farmers in Tharaka South. The smallholder farmers in Tharaka South reported that they did not have ample knowledge on how to interpret the change in behavior of the sky, moon, and wind. (...) The dominant climatic parameters that the farmers' reported to have varied were rainfall and temperature patterns. Farmers' perceived vari- ations in rainfall patterns over three decades in the study area. However, the farmers in the two areas perceived the rain variation to deviate differently. (...) More erratic/ unpredictable rain was the change perceived by a ma- jority of the respondent smallholder farmers (81% and 72% in Tharaka South and Kitui Central, respectively). The least perceived change was the early onset of the rains (26% and 24% in Tharaka South and Ki- tui Central, respectively). (...) The farmers also identified events when rainfall was higher than nor- mal since the 1980s. Results showed that such incidents were experi- enced in the year 1989/1990 and 1997/1998. The event in 1997/1998 was identified as the worst and was associated with El-Niño, during which buildings and roads were destroyed, thus hampering the day- to-day activities. (...) Temperatures were perceived to have increased in recent years by a majority of the smallholder farmers (over 80%) in the study area. They perceived the variation in temperatures to be "unexpected" and "unusual." Events when temperatures were found to be higher than normal oc- curred in 2009 in Tharaka South and in 2005, 2012 in Kitui Central. Our findings of increased temperatures perception by the farmers.
6	Climate change impacts on nomadic herders' livelihoods and pastureland ecosystems: a case study from Northeast Mongolia	Tugjamba, N.; Walkerden, G.; Miller, F.	Regional Environmental Change	2021	10.1007/s10113-021-01829-4	"Elders remember that the weather was pleasant and humid between 1984 and 1996. Long and prolonged rainy days lasted for three to four days, even a whole week. (...) All respondents agreed that weather and environmental conditions had changed significantly in the case study areas over at least the past two decades. Our discussions started by wondering why this summer was coming so late and continued to how dry the last winter was. The interviewees highlighted that until "last March" (2018) there was no snow at all in the region. In Mongolian terms, this means that 'black dzud' (a lack of snow on the pasture) had occurred in the winter. According to the informants, the weather becomes more "unstable and unpredictable" with "less and late rainfall","less hot summer days", and more "cold and windy spring days". According to informants, the amount of precipitation is decreasing, and the timing of precipitation is changing in the case study area. (...) All informants talked about the seasonal changes. (...) The herders suggest that the seasons have changed, and a seasonal shift has occurred. (...) Perhaps surprisingly, herders consider that cloud seeding is having negative impacts on weather patterns. Since 2006, experiments on cloud seeding have been conducted widely in Mongolia. According to the herders, cloud seeding has made the weather more unpredictable and unstable, and this has an impact on traditional weather forecasting methods and practices. The nomadic herders believe themselves to be constantly ''under the sky power'' with the support of "mother earth", and "the realization that nature in general and weather, in particular, control their lives is ubiquitous and explicitly formulated" (Marin 2010). Nomads believe that humans need to be respectful to nature; otherwise, it will 'pay back'. Cloud seeding is seen as disrespectful. (...) The variations herders have experienced in the timing of precipitation has been more important for their livelihoods than the variations they have experienced in the total rainfall. According to herders, the number of warm rainy days in July and August is decreasing. (...) The herders claim that the distribution and abundance of plants on pastures has changed due to increasing aridity and intensive herding around water sources, and that the plant growing season has changed due to less or late rainfall. Consequently, harvesting times and practices have changed. In addition, herders noted a decrease in the yield of various vegetation and plant species. Some useful plants for cattle breeding and medicinal plants have already disappeared and less useful plants have grown".
11	Constraints for adopting climate-smart agricultural practices among smallholder farmers in Southeast Kenya	Autio, A.; Johansson, T.; Motaroki, L.; Minoia, P.; Pellikka, P.	Agricultural Systems	2021	10.1016/j.agsy.2021.103284	"The household interviews showed that 92% of respondents had observed a change in weather conditions during the past 20-year period, with increased variability, temperatures, and either reduced or unreliable rainfall across the sites. (...) Of the survey respondents, 60% had experienced either low or non-existent yields due to these challenges. Only 20% of respondent households had been self-sufficient in terms of food they would normally produce throughout the previous year (two seasons), and 57% of respondents identified no significant income activities outside of farming. (...) Forty-five per cent of respondents identified pests as their most significant natural disaster challenge, with fall armyworm (Spodoptera frugiperda) infestations being the most cited. Other key challenges were human–wildlife conflicts, mentioned by 31% and mostly caused by elephants (Loxodonta africana) and monkeys (such as Cercopithecus mitis, Chlorocebus pygerythrus), and strong winds causing erosion and structural breakages, mentioned by 14%. (...) Key informant interviews noted human–wildlife conflicts to be rampant due to the human population increase, which has forced farmers to encroach closer to conservation areas and sanctuaries. Floods and droughts were also identified as key challenges.

6	Changes in the environment from perspectives of small-scale farmers in remote Vietnam	Nguyen-Anh, T.; Nong, D.; Leu, S.; To-The, N.	Regional Environmental Change	2021	10.1007/s10113-021-01835-6	"The mean value of 0.35 for positive perception indicates that about 35.0% (n = 321) of surveyed farmers perceived the variability taking place in their living environment, i.e., variations in rainfall and temperature or increased incidence of droughts and floods, in the past 5 years. 42.1% (n = 386) of surveyed farmers replied with neutral perception where they were uncertain about whether climate change effects have weakened, remained the same, or intensified. While the remaining 22.8% (n = 209) of farmers perceived no impact from climate change on their agricultural production. (...) In this study, we asked how people perceive climate change or natural hazards in relation to five indicators after consulting with local officials and senior villagers in the study regions. These five indicators are (1) increasing frequency of flash floods and droughts, (2) longer and earlier dry season compared to the past, (3) increasing extreme temperatures, (4) increasing erosion or landslides, and (5) increasing heavy rains. The survey data shows that most people perceive (i.e., agree and strongly agree) changes in climate through their own observations in the past five years. Only around one-tenth of respondents disagree or strongly disagree about changes in climate (n = 91). In other words, those respondents do not believe that increasing incidence of natural hazards has occurred in their living areas. The proportion of survey participants not certain about the worsening trends of these five natural hazards is quite high, ranging from 11 to 22%, or 100 to 201 respondents. The question related to changes in temperatures receives the lowest agreement. That is, only around 65.9% (n = 604) of total respondents believe that temperature has increased over time, while 22.3% (n = 201) are uncertain. The higher percentage of uncertain answers reflects that it is more challenging to convert observations into the perception of temperature changes over the four seasons if respondents do not particularly participate in activities that are closely affected by variations in temperature. However, other natural hazard indicators are more palpable and therefore these are manifested as a higher percentage of agree and strongly agree responses. Specifically, around 87.4% (n = 799) of people perceive that heavy rains have increased, while only less than 2% (n = 18) disagree with the statement. The agreed and strongly agreed percentage number for increasing frequency of flash floods, landslides and droughts are similarly high at 80.4% (n = 733). Two-thirds of all respondents also believe that dry seasons are arriving earlier and lasting longer. One important implication from the survey results in Table 3 is that those people who believe in natural hazards intensifying in their living areas also possess heightened risk perception. (...) Connecting with the survey result reported in Table 3, there is a positive correlation between farmers' belief in a higher incidence of natural hazards and having a stronger perception of risks. (...) Furthermore, 73.50% (n = 673) to 81.89% (n = 751) of survey participants believe that (1) climatic variability is damaging their production fields, (2) diseases and pests are increasing due to climate change, and (3) climatic variability is affecting sustainable biodiversity (Table 4). Only 43.67% (n = 400) of the respondents believe that humans can mitigate the impacts of climate change, while a large number of 329 respondents (35.92%) do not agree with the statement.
6	Fisher's perceptions inform adaptation measures to reduce vulnerability to climate change in a Mexican natural protected area	Salvadeo, C.; Morzaria-Luna, H.N.; Reyes-Bonilla, H.; Ivanova-Bonchera A.; Ramírez, D.P.; Juárez-León, E.	Marine Policy	2021	10.1016/j.marpol.2021.104793	"In general, the increase in Sea Surface Temperature (SST) is considered by fishing communities as the factor with the greatest potential for damage, and therefore the factor to which communities are most vulnerable; followed by the decrease in primary productivity in marine ecosystems, and the rise in sea level. (...) The increase in the intensity and frequency of storms and ocean acidification were also mentioned in the participatory community workshops, but to a lesser degree (Table 2). With regard to storms, the greatest expected effects are related to the loss or destruction of infrastructure of strategic interest (piers, access roads, light poles) and fishing gear (traps, boats, etc.), in addition to the loss of work days and damage to benthic resources of high commercial value (lobster, abalone, etc.). In the case of increased ocean acidification, they highlighted the need for more ecological studies to understand why some marine invertebrates (i. e. Giant Lion's paw scallop and lobster) have a thinner seashell. (...) The REBIVI is experiencing the effects of climate change, including changes on temperature, rainfall, temperature range, and the number of warm tropical and cool nights [43]. Previously, [39], found that residents of Natural Protected areas in the State of Baja California Sur, understood the effects of climate change and the changes occurring within their immediate landscape, with a high percentage (65%) indicating negative effects on fisheries from changes in ocean conditions.
6	Determinants of farmers' perceptions of climate variability, mitigation, and adaptation strategies in the central highlands of Kenya	Mairura, F.S.; Musafiri, C.M.; Kiboi, M.N.; Macharia J.M.; Ng'etich O.K.; Shisanya C.A.; Okeyo J.M.; Mugendi D.N; Okwuosa, E.A.; Ngetich, F.K.	Weather and Climate Extremes	2021	10.1016/j.wace.2021.100374	"Regarding farmers' perceptions of climate variability, most farmers perceived that climate had changed during the preceding 10 years (81%), while only 19% of the farmers did not report variations in climatic parameters during the same period. (...) There were significant statistical relationships between off-farm occupation ($p = 0.05$), TLU ($p < 0.001$), and farm size ($p = 0.038$) with farmers' perceptions of climate variability. (...) About 76% of farmers who perceived climate variability engaged in off-farm activity while 88% of the farmers who perceived climate variability did not engage in off-farm activities. These findings implied that farmers without off-farm activities were more likely to perceive climate variability compared to their counterparts with off-farm activities. (...) The average arable farm size was 0.72 ha among farmers who perceived climate variability and 0.68 ha for non-perceiving farms. Farmers with larger land areas were more likely to perceive changing climate because their probability of experiencing more significant losses caused by climate variability was higher, which increased their risks to weather variation and climatic extremes. Such climate-related risks include soil moisture stress, pests and diseases, and water scarcity leading to higher perception levels. (...) The average TLU was significantly larger (2.22) for farmers who perceived climatic variability compared to their counterparts who did not (1.27) ($p < 0.001$). This implied that farmers with larger arable land and TLU were more likely to perceive climate variability. (...) About 32% of farmers who perceived climate variability were agricultural group members compared to 7% of non-group members. Perceiving households (16%) compared to non-perceivers (2%) had received agricultural credits. Also, perceiving farmers (42%) accessed agricultural training compared with those who did not perceive climatic variation (16%). Those who perceived climate variability (25%) attended agricultural training compared with their peers (12%) who perceived otherwise. (...) About 64% of the farmers who perceived climate variability and those who did not (49%) recorded sloping terrain. This indicated that farmers with sloppy fields were more likely to perceive climate variability. Sloppy terrains are prone to topsoil losses through erosion, thus reducing agricultural productivity associated with climate variability. Approximately 34% and 14% of the farmers reporting climate variation and those who did not pointed out that their soil fertility status was good. This implied that farmers whose soil fertility status was good perceived climate variability. (...) The majority of farmers (86%, n = 256) from the study area perceived variations in climate across all key indicators during the decade that preceded the survey, with the highest number of farmers recording a change in rainfall amounts (98%, $p < 0.01$) and the lowest in flooding frequencies (54) (Table 5). Most of the farmers reported increases in temperature (80%, $p < 0.001$), early rainfall cessation (73%, $p < 0.001$), flooding incidences (73%, $p < 0.001$), late rainfall onset (59%, $p = 0.003$) and drought incidences (58%, $p = 0.014$). Similarly, a large segment of farmers perceived rainfall amounts (78%, $p < 0.001$) and season length (76%, $p < 0.001$) to have declined. (...) Majority of farmers (96%, $p < 0.001$) and minority (41%, $p = 0.003$) perceived that climate variability was causing changes in natural forest cover and soil erosion, respectively (Table 5). Smallholder farmers perceived adverse effects of climate variability on natural (96%, <0.001) and planted forest cover (95%, $p < 0.001$), soil fertility status (86%, $p < 0.001$) and agricultural production trends (82%, $p < 0.001$, Table 5). (...) The study findings revealed six main determinants across three predictor sets influencing farmers' perceptions of climate variability, including TLU, agricultural training, soil fertility status, soil erosion, and changes in agricultural production and planted forest cover to be significant factors influencing perceptions of climate variability (Table 6). Total TLU positively predicted farmers' perception of climate variability. This implied that smallholders with high TLU were more likely to perceive climate variability. Livestock production is generally affected by climate variability. Therefore, farmers with high TLU could have experienced climate variability risks either through reductions or losses in fodder and livestock productivity. Access to agricultural training positively predicted farmers' perceptions of climate variability. This implied that farmers who attended agricultural training were more likely to perceive climate variability. Environmental factors, including agricultural production changes, planted forest cover change, and soil erosion, positively predicted farmers' perception of climate variability. Consequently, farmers who perceived their agricultural land to have poor soil fertility also perceived variability in climate".

6	Examining local perspectives on the influence of climate change on the health of Hamer pastoralists and their livestock in Ethiopia	Lumborg, S.; Tefera, S.; Munslow, B.; Mor, S.M.	Pastoralism	2021	10.1186/s13570-021-00191-8	"During the interviews and focus group discussions, the majority of participants remarked upon changes in climate. The main climate variations voiced were the irregularity of the seasons, a reduction in the amount of rainfall and increasing drought periods. Many participants explained that the seasons had lost their regularity; the dry and rainy seasons were becoming unpredictable. They were adamant that this was a recent change. The selected quotes below highlight this: You know previously all things happened regularly right. You know the onset of the rainy season, you know when to plough, when to harvest. (Since 2013) things have dramatically changed, the rain become unpredictable, droughts happening. (Female local community member, Angude, FGD02- 22.05.19). For the past 5 or 6 years the climate has changed, seasons have changed. For example, during the dry season we expect rains happening, in the rainy season we have sun. (Male local community member, Shanko Kelema, FGD01-21.05.19). In addition to the irregularity of the seasons, the increasing frequency and duration of droughts was highlighted as a concern by many, as emphasised in the quotes below: The frequency of drought is now increasing. Before, like 5-10 years ago was okay, now it has changed. (CAHW, Asile, A03-CAHW-25.05.19). The biggest challenge is drought. In drought people cannot afford to produce. There is not plenty of grass, no meat, malnutrition and that's also the result of death amongst livestock and this is the biggest challenge. (Male local community member, Shanko Kelema, FGD01-21.05.19). Lack of rainfall was highlighted as a current challenge by many participants. Insufficient rainfall was stressed as a reason for lack of drinking water for communities as well as the non-existence of suitable proximate grazing lands for livestock: There is no water here. They have to go far to get water…. No rain, no water. (Health extension worker, Kolakeja, HW05-HEW-25.05.19). (...) During FGDs, many pastoralists stated that the lack of grazing lands for the livestock to forage, particularly in drought times, was a key issue. Due to the perceived shrinkage of the grazing lands and prolonged drought, many communities explained that a large proportion of livestock were starving and dying. (...) The lack of grazing lands in close proximity to the Hamer villages has led to the herdsmen taking the livestock far away to find suitable rangelands. One FGD participant stated that they now need to take their animals more than 70 km away. This was outlined as a problem disproportionally affecting cattle, as they require vast rangelands to graze. On the other hand, goats were labelled as browsers, meaning they would eat many shrubs and could survive close to the Hamer settlements. A FGD participant explains this: For goat no problem, goats can eat leaves, you know they can take little bits. But for cow, cow wants big grass and a lot of things. So we go very far with cattle. Goats can stay here and be strong. Stronger than cow. (Female local community member, Sinbele, FGD04-25.05.19). (...) Not directly related to livestock health but due to the scarcity of sufficient grazing lands, intra-ethnic and inter-ethnic violence was identified by many as becoming an issue. Encroachment on other communities' territories was leading to clashes and the raiding of neighbouring livestock: Pastoralists in Omo valley, they stole the animals from each other. For example, from this village at drought time they take their animals to find water near the Omo river, at this time the neighbours from the other side will come to steal their animals. (Female local community member, Angude, FGD02-22.05.19). (...) The influence of climate change on the health of pastoralists was perceived by communities as being indirect". (...) Hamer pastoralists were very aware of recent changes in climate. Whilst they may lack understanding of the scientific details of climate change, communities voiced their experience of changes in weather over time and recalled significant climate events. Their experience of the growing irregularity of seasons, inadequate erratic precipitation and an increase in drought periods largely fits with climate predictions for the region".
2	Agricultural community-based impact assessment and farmers' perception of climate change in selected Ecological Zones in Nigeria	Oluwatimilehin, I.A.; Ayanlade, A.	Agriculture and Food Security	2021	10.1186/s40066-020-00275-5	"Majority of rural farmers in Ondo and Ogun states opined that the temperature in general has become warmer while in Kwara states, the majority believed it has remained the same. Though farmers perceived it has remained the same on a general note, the climatic data of the Ogun and Kwara states showed that it has been warmer since the year 2000 to the end of the study period in 2017 in Ogun state and for Kwara, it was warmer between 1982 and 1986, colder between 1987 and 1997 and have generally remained warmer since. (...) Majority of the farmers in the three states believe that the temperature of the coldest season has remained the same over the years. The perception of farmers (Table 5) about the temperature of the hottest months as opined by the majority of the farmers in Ondo and Ogun states, have been reported to have increased significantly while the majority think that it has remained the same over the years in Kwara state. The rain generally and the rain during the rainy season which spans usually April to October have been reported by farmers to be higher than it has been in the past in Ondo and Ogun while a higher proportion of farmers perceived that the rain has remained the same in Kwara states and this was found to corroborate with the analysis of rainfall data. The rain during the dry season has been reported to be higher in Ondo while it has generally remained the same in Ogun and Kwara states. The occurrence of the extreme flood was perceived by farmers to be more frequent in Ondo and Kwara while the majority of the farmers in Kwara believe that it has remained the same over the years. For the occurrence of extreme droughts, it was reported to be less frequent in Ondo, more frequent in Ogun and same in Kwara state (Table 5). The rainy season duration was reported to be earlier in Ondo while it has remained the same in Ogun and Kwara states as opined by the majority of the farmers. The length of the dry season was by majority of the farmers to have remained the same in Ondo, Ogun and Kwara states. Figure 2a shows farmers' perception on temperature generally. Majority of the farmers in Ondo state are of the opinion that the temperature is warmer while majority in Ogun and Kwara states are of the opinion it has remained the same over time. Figure 2b shows perception on rainfall for which the majority in Ondo and Ogun opined has been higher while majority in Kwara said it has remained the same. Occurrence of extreme floods is depicted in Fig. 2c for which majority said it has remained the same in Ondo meanwhile it has been more frequent in Ondo and Ogun states. (...) In Onibode, Ogun state, the FGD conducted revealed that farmers have perceived climate change and are of the opinion that the drivers of climate change are natural rather than human-induced. There were observed changes in the mean temperature, frequency of cold days, sunny days, the intensity of solar radiation and heavy rainfall events were generally agreed to be on the increase. The frequency of warm days with changes in mean rainfall was agreed to be higher. However, a particular farmer in a separate interview opined that heat starts from December, therefore, they start preparing land for cultivation and that dry season starts from December and last till March (about 4 months). Also, he stated that the number of rainy days is now more and farmers now grow new crops that are not native to their land. (...) Many aging farmer said that they used to plant rice in the past but not anymore because of changes in the biophysical environment probably associated with climate change. (...) The chief of Onibode (Baale) an adult in his early 70 s age and a farmer in his 50 s in Onibode who did not state categorically his age but have been in farming for about 30 years is of the opinion that the rain is still falling well but not exactly like it used to be both in the rainy and dry seasons. The temperature, the wind, the cloud formation among others has remained the same over the years. The date for the first rain of the year is 15th of March and that still remain intact. He stated that the rain is not like it used to be, as there is a significant reduction in the amount of rainfall and the distribution through the year. In the past, the rain do come in different ways, we have that of 3 days, 7 days and even 15 days of continuous rainfall".

16	Adapting to Climate Change Through Conservation Agriculture: A Gendered Analysis of Eastern Zambia	Umar, B.B.	Frontiers in Sustainable Food Systems	2021	10.3389/fsufs.2021.748300	"Survey results showed that almost all respondents (98%) were familiar with the concept of climate change. Late on set of the rainy season and a shortened rainy season were the most reported experiences of climate change by both male and female respondents. Men and women's focus group discussants had similar perceptions of how climate had changed in Eastern Province. There was a consensus across all the districts and between men and women on climate change manifesting through late onset of the rainy season and a shortened rainy season. Focus group discussants typically referred to early onset of rains in the past by referring to important days such as Zambia's independence day, Christmas and local annual traditional ceremonies. For instance, one woman discussant from Nyimba said this, "When we were young, it used to rain on independence day, or even before. Even our parents told us that by independence day holiday, it would have started raining. But nowadays, by the time we are celebrating Christmas, there are no rains." An illustrative quote from the men's FGDs in Nyimba is the following, "before we used to get good rains. It would rain over a longer period. It would rain just after we came back from the Tubimba ceremony held in September." In a survey of 86 men and 86 women smallholder legume farmers in Chipata, eastern Zambia Mphande (2021) reported that both men and women similarly perceived that climate change in Chipata manifested through shorter rainy season, late start of rainy season, intra–seasonal droughts and heavy downpours. (...) Survey results show that almost two-thirds (65.4%) of the respondents thought that there were no differences between how men and women were affected by climate change, while 34.6% perceived differences. Results from the men and women's FGDs show both differences and similarities in their perceptions of effects of climate change and women (Figure 4). All the women's FGDs observed that climate change had resulted in women experiencing lower crop yields. Half of the women's FDGs mentioned outbreaks of armyworms (Spodoptera frugiperda), as having exacerbated low crop yields. An overall reduction in average rainfall (due to a shorter rainy season) was noted to have led to less water in streams and subsequently less fodder and water for livestock, and women having to walk longer distances to get water from the few water sources that were still perennial. Due to streams drying up, grasses also dry up, resulting in fodder and water shortages for livestock. The women discussants explained that due to poor rains, they get very poor maize and groundnut yields. Pests attack the maize further reducing the yields. Consequently, households experience hunger and reduced crop incomes. (...) The women's FGDs fromMambwe district narrated increased wildlife conflicts as having resulted from changes in the local climate. "Due to late planting, our crops are still in the field in March, so elephants eat them. Before, we would plant early and harvest by March." The women contended that they were more negatively affected by climate change for several reasons. They expressed views such as the following: "Women suffer more due to climate change as they look after children." "There are more diseases when there are droughts so women suffer more as they have to take children to hospitals. Men just drink." "Water is scarce. We have to move longer distances to find water." Men thought that increased hunger, lower crop yields, reduced domestic water sources, reduced agricultural income and more livestock disease was how climate change most commonly affects women (Figure 4). (...) Although most of the perceptions between men and women related to gender roles, some were furthermediated by location and bio-physical characteristics. (...) Women FGDs thought that reduced crop yields, reduced water for livestock, outbreaks of armyworms, increased pesticide use on crops and increased livestock mortalities where what men commonly faced due to climate change (Figure 5). (...) For the men's FGDs, the most commonly cited effects of climate change on men were increase in livestock diseases, reduced crop yields, increased hunger, reduced agricultural income and increase in human diseases (Figure 5). (...) The men's FGDs also mentioned that reduced crop and the concomitant reduction in household food security as some of the main effects of climate change".
10	Assessment of smallholder farmers' perception and adaptation response to climate change in the olifants catchment, South Africa	Olabanji, M.F.; Davis, N.; Ndarana, T.; Kuhudzai, A.G.; Mahlobo, D.	Journal of Water and Climate Change	2021	10.2166/wcc.2021.138	"Climate change in this study is defined as the perceived changes in average temperature and rainfall over the last 30 years. Therefore, the perception of climate change from respondents was based on their farming experience over the last 30 years. Of the total 120 household farmers surveyed in the catchment, descriptive analysis revealed that 98% of respondents are aware of the changes in the climatic conditions in the area, based on perceived changes in temperature and rainfall. Table 2 indicates that crop farmers in the Olifants catchment are observing climate change in the form of increased temperature (87%), decreased duration of rainfall (76%) and early cessations of rainfall. Respondents also perceived a decrease in temperature (37%) and rainfall events (65%). Most of the smallholder farmers expressed their perception based on their observation of a colder winter and warmer summer temperatures as well as increased rainfall variation over the last 30 years. (...) Crop farmers in the Olifants catchment have experienced decreased rainfall and a delay in the starting of rainfall during the planting season. They have also perceived colder winter and warmer summer temperatures".
2	Perception and adaptation of pastoralists to climate variability and change in Morocco's arid rangelands	Snaibi, W.; Mezrhab, A.; Sy, O.; Morton, J.F.	Heliyon	2021	10.1016/j.heliyon.2021.e08434	"Regarding climate perceptions, pastoralists have noticed several variations in their recent climatic conditions compared to the period before 1970, namely an important reduction in annual rainfall totals and increase in temperature and extreme weather events (i.e., droughts, heavy rains, high winds and sandstorms). (...) The results relating to the perceptions of pastoralists regarding climate variability and change are presented in Figure 4. The pastoralists surveyed were asked whether they have perceived any changes in their current climate in comparison with that of the last five decades. All of the pastoralists interviewed have observed a significant drop in the total annual rainfall, particularly from the 1970s. (...) In addition, the majority of respondents (more than 97%) noted an important disruption of the rainy season, which resulted in the reduction of rainy days, a delayed onset of the rainy season and the appearance of frequent dry spells during this one. (...) Furthermore, a significant proportion of the surveyed pastoralists (67%) perceived an increase in heavy rains leading to flooding, with considerable damage on the herds, tents and road infrastructure. Over 91% of respondents noted a significant change in the temperature regime during the last five decades. In fact, the majority of pastoralists (82%) observed an increase in temperature, particularly in the southern area (91%). Decreased rainfall combined with high summer temperatures has resulted in a desiccation of the local climate with negative repercussions on plant cover and the availability of water resources. In addition, the increase in the occurrence of droughts was noted by a large majority of interviewees, i.e. 97%.(...) The increase in the frequency of strong winds, sometimes causing damaging sandstorms, was cited by a large proportion of respondents (81%), particularly those in the southern area.(...) Hence, we can conclude that pastoralists' perceptions are perfectly consistent with the climatic trends actually observed in the high plateaus of eastern Morocco.
6	Perceived effects of climate change and extreme weather events on forests and forest-based livelihoods in Malawi	Chisale, H.L.W.; Chirwa, P.W.; Babalola, F.D.; Manda, S.O.M.	Sustainability (Switzerland)	2021	10.3390/su132111748	"The results on the observed climate variability and change show that participants from both study sites perceived a general increase in all the climate extreme events apart from hailstorms and landslides in their locality (Table 2). Erratic rainfall, which refers to the unpredictable and out of season rainfall, was perceived to have increased over the past 20 years by 83.3% and 95.4% in Mchinji and Mangochi, respectively. (...) Though not statistically different, flooding events have increased in frequency by 81.5% in Mchinji compared to 84% in Mangochi. On the other hand, incidences of high temperatures have increased by 79.5% in Mangochi compared to 71.4% in Mchinji. The other notable perceptions on climatic events in the study are the reduction in the incidences of hailstorms in Mchinji (60.4%) and Mangochi (53.8%) and landslide incidences in Mchinji (51.6%) and Mangochi (53.8%). (...) Generally, all the observed extreme weather events were perceived to have affected and reduced access to the forest for more than three months for essential forest products for livelihoods of 65–94% (n = 150) of forest-based households in Mangochi and 59–92% in Mchinji (n = 155). However, it was only erratic rainfall that was perceived to pose extended reduced access to the forest for essential forest products to 61.2% and 42.5% of forest-based households in Mchinji and Mangochi, respectively. Likewise, a small proportion of forest-based households in Mchinji (32.6%) and Phirilongwe in Mangochi (42.5%) perceived extended reduced access to the forest due to prolonged droughts. The results further record that high temperatures did not affect access to forests for the livelihoods of 41% of forest-based households in Mchinji and 35% in Mangochi. All these results were statistically significant (p = 0.05) apart from the results on prolonged drought. However, the results from both the Focus Group Discussions (FDGs) and key informant interviews recorded that increased high temperatures are not a concern for the forest-dependent communities in both sites".
10	Smallholder farmers' perceived climate-related risk, impact, and their choices of sustainable adaptation strategies	Al Mamun, A.; Roy, S.; Islam, A.R.M.T.; Monirul Alam G.M.; Alam E.; Pal S.C.; Sattar, M.A.; Mallick, J.	Sustainability (Switzerland)	2021	10.3390/su132111922	"To investigate farmers' perception of climate change, they were asked their opinion on whether the temperature, rainfall, flood, and drought frequency in the region over the last 30 years had increased, decreased, or did not change, or if they did not know. (...) Regarding temperature and drought in Phulbari Upazila, 93% and 69.87% of the farmers, respectively, perceived an increase. The farmers observed irregularities in this climatic variable with time and distribution, which caused solemn concerns for their farming plan. The study revealed that the farmers perceived the rainfall as slightly decreasing, and that the flood frequency was continually increasing due to the geographical transboundary river setting. In Phulbari and Hatibandha Upazilas, 37% and 34% of the farmers respectively perceived that the rainfall was decreasing. Regarding flood intensity, most of the respondents in Phulbari and Hatibandha Upazilas perceived that flooding was increasing, and the ratios were 88.73% and 94.68%, respectively. More importantly, the farmers' perception of rainfall and temperature changes was also supported by the observed meteorological data. (...) The SCCRPI values in both the Upazilas represented that the farmers' perceived climate-related risk type was heterogeneous, and varied from 40–72.40 in Phulbari Upazila and 44.13–73.73 in Hatibandha Upazila (Table 3). Most of the farmers in both Upazilas had medium to very high risk perception index values (Table 3). Farmers rated various climatic events such as droughts, floods, riverbank erosion, and other events on a scale of very high, high, medium, low, and very low, depending on psychological, socio-economic, demographic, and cultural factors [54]. (...) The CRRPI showed that in both the Upazilas, farmers perceived that floods, droughts, riverbank erosion, heatwaves, crop pests, and irrigation risks were the significant risks of climate change".

11	Climate change perception and impact of on-farm demonstration on intensity of adoption of adaptation strategies among smallholder farmers in South Africa	Ojo, T.O.; Ogundeji, A.A.; Belle, J.A.	Technological Forecasting and Social Change	2021	10.1016/j.techfore.2021.121031	"As revealed in Table 3, the coefficient of education of the household head is positive and statistically significant in influencing climate change perception of smallholder farmers in the study area. (...) The coeficient of distance to market was positive and statistsically significant in influencing the perception of farmers about climate change. (...) Membership of farmers to farm-based organizations was positive and statistically significant in influencing the likelihood of farmers' climate change perception. This implied that membership in farmer-based organizations increased the farmers' probability of perceiving the effect of climate change. (...) The result of the study showed that land rights was positive and statitistcially signigificant in influencing farmers' perception about the effects of climate change. (...) The coefficient of drought was positive and statistically significant in influencing farmers' perception of climate change. (...) The variable ICT_radio was positive and statistically significant in influencing the probability of farmers perceiving the negative effect of climate change.
10	Smallholder farmers' perception of climate change and drivers of adaptation in agriculture: A case study in Guinea	Ceci, P.; Monforte, L.; Perelli, C.; Cicatiello C.; Branca G.; Franco S.; Diallo F.B.S.; Blasi, E.;	Review of Development Economics	2021	10.1111/rode.12815	"In fact, as shown in Table 1, only 11% of the surveyed households did not perceive any temperature change, while 29% of them reported no change in precipitation. Increased temperature in the 10 years before the survey was reported by 63% of the households interviewed and decreased precipitation during the same time span by 50% of the sample. With reference to precipitation, we assumed that the people interviewed considered the number of storms happening each year as an element to assess changes in precipitation".
6	Indigenous knowledge about climate change and sustainability of nomadic livelihoods: understanding adaptability coping strategies	Ghazali, S.; Azadi, H.; Janečková, K.; Sklenička P.; Kurban, A.; Cakir, S.	Environment, Development and Sustainability	2021	10.1007/s10668-021-01332-0	"The results showed that nomadic households are well aware of climate change due to mean descriptive variables such as age, education, number of household livestock, and monthly income. (...) Nomadic perceptions in the context of changes in mean temperature were in admission with observed meteorological changes. Both indicate a significantly changing mean temperature. Survey data analysis (Table 2) indicates that 215 out of 225 Kashkooli nomadic households answered positively on having a significant change in overall temperature pattern as mean temperature. Moreover, 72.89% of nomads perceived significantly that mean temperatures of spring and summer have increased. In addition, 78.66% of nomads perceived significantly that mean temperatures of autumn and winter have decreased. Therefore, most nomads perceived that the mean temperatures of hot and cold seasons have increased and decreased, respectively. (...) Based on the results, 65.78% of the Kashkooli nomadic households noted a significant change in precipitation patterns as severe rain, snow, and hail over the last 30 years (Table 3). There was also a perceived decrease in the amount of sum of rainfall which is in agreement with the climate measurement observations. 75.56% of the respondents perceived that the length of the rainy period, from the first day of rainfall to the last, has decreased significantly. The perceived change in the length of the rainy period also implies the perception of changes in the timing of the rainy period. In particular, 99.11% of the respondents perceived that the timing of the rainy period has become more erratic in unexpected times. The survey on gathered data indicates that 219 of the 225 nomadic households have believed that climate change will persist in the future. Therefore, climate changes are happening more than before. This means that Kashkooli households were more likely to be exposed to the risk of changing climate. Hence, most nomads perceived climate change strongly. Perceived changes of climatic and environmental variables affected nomadic livelihoods. These impacts included temperature pattern changes (e.g., mean temperature) and precipitation pattern changes (e.g., severe rain, snow, and hail and drying of main water sources), and degraded rangelands were detected by 68.44%, 66.67%, 75.56%, and 68.89% of nomadic respondents, respectively (Table 4).
6	How local communities attribute livelihood vulnerabilities to climate change and other causes: a case study in North Vanuatu	Nef, D.P.; Neneth, D.; Dini, P.; Abad, C.R.; Kruetli, P.	Climatic Change	2021	10.1007/s10584-021-03221-x	"As for climate change, the perception of the severity of the problem differs considerably across islands. During the workshops, the "climate change impacts" on livelihood strategies were reported as more critical than in the interviews (Online Resource 4). We asked the participants to clarify the perceived climate change by describing in detail their observations of changes in weather conditions over a 30-year period and to explain to what extent these changes have affected their livelihood strategies. Study participants reported a total of 90 observations of perceived change in weather conditions (Table 2), 79 of which were described as directly adversely affecting the productivity of gardens or other sources of food and income (Table 3). (...) Long periods of drought are perceived as a fundamental problem for local gardens. Particularly, farmers reported difficulties with yam, island cabbage, and bananas during dry periods. Moreover, these drought periods were often experienced as being accompanied by high temperatures, conditions associated with increased crop failure, and increased pest outbreaks. Furthermore, high temperatures were seen as a cause of high fish mortality. Except for Merig, people of all islands reported that, especially towards the end of such drought periods, when the water temperature near the shore has risen significantly, it is common to find many dead fish on the beach. In contrast, the impact of heavy rains on crops or natural resources is less severe. Only on Mere Lava did respondents report that heavy rainfall can induce landslides. During severe events, large masses of sand and debris are transported into the sea, which, according to the local population, negatively impacts fish abundance. Besides extreme events, interviewees and workshops' participants observed changes in weather patterns. In particular, they reported that seasonal weather conditions have become increasingly variable and thus unpredictable (Table 2). (...) Respondents reported that the abrupt change between sunshine and rain adversely affects the productivity of gardens by harming large-leaved plants, such as yam or island cabbage, with leaves more susceptible to burns in direct sunlight if they are wet due to previous rain. In addition to these changing patterns, local people also reported a significant intensification of prevailing weather conditions, especially during the rainy season, when more rain falls than before, especially prior to the transition towards the dry season. Farmers reported that more precipitation throughout the year affects tuber plants, such as yam (Table 3)".
6	Adaptation Measures to Climate Change as Perceived by Smallholder Farmers in the Andes	Ballesteros, J.; Isaza, C.	Journal of Ethnobiology	2021	10.2993/0278-0771-41.3.428	"Regarding their perception of CC, all of the smallholders had heard of the phenomena and 67% felt affected by climate change-related events. Mostly, they defined CC with concepts related to a growing uncertainty to predict seasonality and to the magnitude of climatic events, such as rainy periods. Smallholders also defined CC as an increase in the occurrence and intensity of extreme climatic events (i.e., El Niño), as expressed by one person in Subachoque, who stated "there is a change in when we expect rains. Now, we do not know when it is going to rain, how much it is going to rain and how long it is going to last, bringing uncertainty to what we can cultivate." More than half of the interviewees could make a distinction between CC and weather variability events, and they used variability events to define CC (Table 2). Twelve interviewees acknowledged CC as a result of human activities. They mentioned changes in patterns, quantity, and duration of most of the CC events".
6	Perceptions, vulnerability and adaptation strategies for mitigating climate change effects among small livestock herders in Punjab, Pakistan	Faisal, M.; Abbas, A.; Cai, Y.; Ali A.; Shahzad M.A.; Akhtar S.; Raza M.H.; Ajmal M.A.; Xia C.; Sattar, S.A.; Batool, Z.	International Journal of Environmental Research and Public Health	2021	10.3390/ijerph182010771	"Study participants were asked questions regarding their concerns and perceptions about the frequency and intensity of CC events they had observed in the past 10 years. We only considered responses narrated by the majority of respondents who believed that CC was occurring in terms of climate-related events that had not previously occurred. Table 3 lists these perceptions of the respondents in the study area. It is clear that, in the past 10 years, the majority of the respondents observed an increase in high and low temperature variations. They also believed that the rainfall pattern had changed while noting a drop in the frequency of extreme climatic events (droughts and floods), and thus considered these events to be less threatening. As noted earlier, the majority of the respondents (174, 142, and 122) mentioned that the frequency of high/low temperature and rainfall intensity was high, whereas the remainder of the responses indicated the frequency was in the range of medium to very high. Respondents also observed abrupt changes in summer and winter temperatures, as being higher and lower, respectively, compared with the past. (...) Additionally, livestock herders believed that CC led to the emergence of new diseases among their animals with an increased frequency and intensity, and indicated a frequency in the range of high/very high. (...) Table 3 shows the responses of CC risk perception events/variations over the past 10 years and the calculated values of CCRPS and SCCRPI. CCRPS values ranged from 436 to 1151 and SCCRPI values ranged from 26.914 to 71.049. The values showed that livestock herders ranked drought at the lowest level and rainfall pattern change at the highest level of risk perceived from climate change. The responses relating to respondents' perceptions about temperature (high temperature, low temperature) and rainfall pattern are shown in Figure 3. (...) Results showed that respondents' perceptions of the trends in high and low temperatures were verified by the annual mean plotted trends, as shown in Figures 4 and 5, respectively. The graphs show that perceptions about temperature (high/low) were consistent with the meteorological data. The fluctuating trend in temperature is consistent with the stated perceptions of the respondents, both for summers and winters in the study locations. In the case of rainfall, the majority of respondents perceived that the pattern had also changed".
6	Vulnerability of small-scale farmers in relation to climate change and their coping strategies: Case study of southern punjab, pakistan	Luqman, M.; Mehmmod, M.U.; Ashraf, S.; Yaseen, M.; Ashraf, I.	Journal of Animal and Plant Sciences	2021	10.36899/JAPS.2021.5.0341	"Perception about climate change: Table 2 shows the perceptions of respondents about the occurrence of climate change. Of the total respondents, 61.7% responded had the knowledge about the climate change. This extended awareness was due to accessibility of multiple information sources including traditional, moderns and institutional resource such as public and private sector extension field staff. Conversely, 38.3 refused having understanding about the climate change. Close to one fifth (18.3%) respondents witnessed moderate increase in temperature in recent past. About 44% respondent felt temperature very hot and 37.5 reported temperature being hot with the passage of time. The erratic changes in temperature were anticipated to impact the crops adversely. Majority of respondents (65.8%) reported reduction in the yield due to increase in temperature. During informal discussion respondents augmented that temperature is increasing and they do not have access to the heat resistant varieties and were lacking in much needed information about the climatic events. The exposure of farmers to different determinants of climate change at different stages of the crops made the farmers well verse regarding understanding the impact of temperature in crop yield.(...)

10	Local perceptions of climate change and adaptation responses from two mountain regions in tanzania	Kaganzi, K.R.; Cuni-Sanchez, A.; McHarazo, F.; Martin, E.H.; Marchant, R.A.; Thorn, J.P.R.	Land	2021	10.3390/land10100999	"Most respondents (70%) on both mountains reported increased temperatures during the dry and the rainy seasons and a reduction in the number of frost days (Figure 2). Most respondents (70%) on both mountains also observed a reduction in the duration and amount of rainfall and fog during the long rains and an increase in dry spells and strong winds. Most respondents reported decreased stream flow and fewer hailstorms, and increased rain showers during the dry season. One main difference between the two sites were reports of increased extreme events, particularly floods and droughts: more respondents on the Udzungwa Mountains reported these compared to Mount Kilimanjaro (80% vs. 30%, respectively). However, more respondents on Mount Kilimanjaro reported an increased number of landslides (45% vs. 5%). In the two high-elevation villages on Mount Kilimanjaro, respondents also noted that the amount and duration of the short rains had changed. This was described by a female leader in Foo as follows: 'Vuli (short rains) have become unreliable. Sometimes there is too little rain to grow crops, and sometimes these rains are so long that they end up destroying the crop'. (...) Within each mountain, few differences were observed between villages at different elevations. On Mount Kilimanjaro, the main differences were that fewer respondents in Mudio (the lowest-elevation village) reported increased rain showers during the dry season, while more respondents in Kokire Mamba reported more landslides. In the Udzungwa Mountains, more respondents in Udekwa reported increased soil erosion (Supplementary Material C). Respondents in both mountains reported reduced crop yields and an increase in crop pests and diseases, but the percentage of respondents varied for the different crops, being greater for maize, beans, coffee, and green banana (Figure 3). On Mount Kilimanjaro, respondents reported the most harmful crop pests as including viwavi jeshi (fall armyworm), which feeds on the stem and leaves of maize; kishori or mnyauko (fusarium wilt of banana), which dries the leaves of green banana and coffee; kimamba (green scale coccus viridis), which coils green leaves for beans and coffee; and kimatira and uwiwi (coffee berry borer), which attacks the fleshy berry surrounding the coffee kernel. On the Udzungwa Mountains, the most harmful pests were viwavi jeshi (fall armyworm) and michilizi (yellow striped virus), which affect maize by stunting the growth of panicles and flowers or causing the plant to be sterile; fangasi (rust), which, in beans, results in stunted growth; and utitiri mwekundu (red spider mites) and vipekecha majani (leaf miner), which, for onions, sucks the plant sap, grinds the leaves, and feeds on the plant tissue. Farmers noticed changes in pest incidence with increased temperature, which created favourable environments and changed ecological niches. For instance, farmers observed wadudu chawa (thrips) increased in abundance on onion leaves when there is little rainfall and high temperatures. Respondents on both mountains reported reduced milk production and an increase in cattle diseases, but more respondents reported these on Mount Kilimanjaro—probably as a larger percentage of respondents in this mountain own cattle, and milk production is an important component of the diet and culture of the Chagga. Surrounding the Udzungwa Mountains, more respondents reported increased diseases amongst goats. In both mountains, respondents said human health was adversely affected by climate change impacts (Figure 3).
10	Indigenous farmers' perception of climate change and the use of local knowledge to adapt to climate variability: A case study of Vietnam	Manh, N.T.; Ahmad, M.M.	Journal of International Development	2021	10.1002/jid.3573	"When farmers were asked about their understanding in terms of change in climate overall, we found that 91.4% of the farmers perceived a change in climate compared to the last 20 years while 8.6% of the farmers did not perceive any change. This shows that a small number of farmers still did not believe that the climate was changing. These findings are consistent with the previous findings of Huong et al. (2017). Out of 362 respondents, 53.6% of Tay farmers noticed the change in climate and 3.6% said no, while 22.9% of H.mong farmers perceived the change in climate and 2.9% did not. Approximately 14.9% of Dao farmers noticed the change in climate and 1.1% did not. Furthermore, the ANOVA shows that there is a significant difference regarding farmers' perception on change in climate compared to the last 20 years at a 5% level. (...) Table 3 shows that 88.1% of the farmers noticed an increase in temperature while 11.9% did not. (...) Many respondents stated that the present weather is too hot and the summer period seems longer than in the last 20 years. One farmer stated 'We never used electric fan during the summer season in the past; but now, without an electric fan, we cannot live'. (...) Remarkably, only 16% of farmers perceived rainfall increase and unpredictability while 84% of the farmers perceived rainfall decrease without significant differences between ethnic farmers' perception on more and erratic rain. (...) the farmers felt that rainfall had decreased. Furthermore, the farmers observed less water in the local streams and rivers compared to many years ago. Besides, the differences in education levels and locations (where they live) of the farmers may have influenced their perception on rainfall. (...) Table 3 shows farmers' perception regarding more natural disasters such as floods, landslides, flash floods and storms, with 64.1% of the farmers perceived more natural disaster events compared to the last 20 years while 35.9% did not. Out of 362 samples, 37% of Tay farmers noticed more natural disasters and 20.2% did not. About 19.3% of H.mong farmers observed more natural disasters while 7.5% did not. Approximately 7.8% of Dao farmers noticed more natural disasters and 8.2% did not". (...) Despite having access to weather information, farmers still use local knowledge to predict the weather, and local knowledge played an important part in their lives. For example, farmers in Nghienloan stated 'Living in mountainous areas, we do farming based on our knowledge.' Approximately 65.5% of the farmers confirmed that they knew and heard about local knowledge while 34.5% did not, indicating that local knowledge is quite widespread. (...) Tables 5 and 6 show in detail how farmers have used biological indicators for weather prediction. For example, the farmers noticed that when frogs croak profusely, they know that rain will come soon. Or when it is raining, if termites come out in large numbers, the rain would stop within 1 h, and sunlight would come out. Furthermore, if farmers observe wild chickens (Garung) sleeping in low brushwood in the forest, heavy rain would come. Local knowledge based on the behaviour of plants and insects is widely used to forecast a severe change in weather patterns. We found that farmers have applied flora as indicators to predict the weather. For instance, when farmers observe a large number of low-flying dragonflies, the rain will come soon. Storms and rain can be forecast when farmers have seen bamboo shoots growing erectly out of clumping bamboos. And when bamboo shoots thrive in the middle of the bamboo grove, a strong storm will happen during that year. Also, if the banana leaves suddenly stand erect and close when there's sunlight, heavy rain is imminent".
6	Women smallholder farmers off-farm adaptation strategies to climate variability in rural Savannah, Ghana	Yiridomoh, G.Y.; Appiah, D.O.; Owusu, V.; Bonye, S.Z.	GeoJournal	2021	10.1007/s10708-020-10191-7	"Table 2 presents women responses on the occurrence and severity of climate extremes. The results indicated that two of the climate extremes (Drought = 1.2288; Bushfires = 1.0360) had standard deviation more than 1.0, which implies that there were extremes in the scoring by the respondents. Flood was observed to have a standard deviation of 0.7376, which means that women hold a positive perception about it occurrence and severity. In percentage terms, 50% of the respondents indicated that drought over the past one decade was very high while 40% observed that drought was high. Again, eight percent based on their indigenous observation hold the perception that drought was low while three percent also observed that drought was moderately low. For bush fires, 90% of the respondents hold a very high perception about its occurrence and severity while 10% hold a positive view of the occurrence and severity of bush fires. Again, when respondents were asked about the occurrence and severity of flood over the past one decade, 87% of the respondents responded in the positive while 13% of the women responded in the negative. This implies that flood over the last one decade was low. The highest mean was 4.36 with the lowest being 3.08. The results revealed that women took a positive position (above 2.0). All the statements had mean of above 3.70 which indicate that generally, women had a very high perception about the occurrence and severity of climate extremes.
6	How do farmers' perceptions of climate variability and change match or and mismatch climatic data? Evidence from North-west Ghana	Dakurah, G.	GeoJournal	2021	10.1007/s10708-020-10194-4	"The results showed that the rainfall pattern in the past and now are not the same for both the villages of Doggoh, and Tie. Specifically, farmers reported in both villages that the onset of the rainy season has shifted from March to June. (...) From Figs. 11 and 12, one can conclude that farmers' have subjective views on climatic events now and the past. For example, even though, the majority of the respondents reported a shift in the onset and cessation of rainfall from March to June, some respondents reported that the rainfall in the past started in February, April, and May, and now starts in either March, April, May and June. In the contest of the rainfall starting in February in the past, a participant in the household in-depth observed that '' there used to be rainfall around the 20th of February, then we will raise our yam mounds and then prepare the farm fields in the bush but now, it is no longer the same ….'' (HCS-5-D-Male). Similarly, the results from the indepth household case studies indicate subjective farmers' views of cessation of rainfall in the past and now. In the village of Tie, a female participant in the in-depth case study interview opined that ''there used to be heavy rainfall around the end of the 10th Month'' (HCS-17-D-Female). (...) During the data collection, the respondents were asked about their perceptions of 'the onset, cessation, and duration of rainfall in the past, and now' (...). On the parameter of temperature, respondents in both the villages of Doggoh and Tie were asked about their judgements of the nature of temperature in the past and now. In both villages, all respondents surveyed (i.e. 100%) recognised that temperature is now warmer than that of the past. (...) The majority of the respondents; 70.7% and 92.0% respectively in Doggoh and Tie believed that there is more drought now more than that of the past. (...) Unlike drought that the majority of the surveyed respondents in the two villages recognised are on the increase now than the past, for floods, majority of the respondents in Doggoh and Tie perceived that differently. Whereas 52% representing the majority in Doggoh opined that floods have increased in recent times, majority in Tie (48%) noticed that there are less floods now as compared to that of the past as indicated in Fig. 13".

6	Perceived links between climate change and weather forecast accuracy: new barriers to tools for agricultural decision-making	Guido, Z.; Lopus, S.; Waldman, K.; Hannah, C.; Zimmer, A.; Krell, N.; Knudson, C.; Estes, L.; Caylor, K.; Evans, T.	Climatic Change	2021	10.1007/s10584-021-03207-9	"There were differences in the use of weather forecasts across the countries (Figure 3). The lowest rates of weather forecast use were in Zambia and Jamaica at 29%, compared with use rates of 56% in Kenya. (...) We further explored farmers' views of weather. The vast majority of farmers surveyed in all three countries (between 70 and 80%) report that weather is becoming more difficult to predict (Figure 3). Moreover, nearly all of the farmers (between 88 and 98%) stated that they have observed climate changes during their principal growing season (Figure 3). These perceived climate changes appear to affect farmers' perceptions of weather forecasts. In each country, between half and three-quarters of farmers stated that changes to the climate change have affected weather forecasts (Figure 3). As we explore in the next section using data from our more in-depth Zambian survey, the most commonly held belief among farmers was that climatic effects on weather forecasts came in the form of reduced forecast accuracy. (...) As previously described, only 29% of the Zambian farmers used weather forecasts during the 2018–2019 agricultural season (Table 1, Figure 3). Of those who did, they mainly used them to inform the timing of planting and the type and varieties of crops to sow (Suppl. Figure S1). On the other hand, among those 71% of farmers who did not use weather forecasts, their lack of usage cannot typically be attributed to a lack of awareness: approximately 72% of the 768 who did not use weather forecasts were aware that the forecasts existed. The low rates of forecast usage also did not result from the belief that it was impossible to predict the weather. This belief was held by only 16% of the non-using farmers (Table 1). With regard to perceptions of the weather forecasts' accuracy, Zambian farmers had differing views: 39% perceived the forecasts to be mostly or always accurate, compared with 23% and 14% who perceived them to be sometimes accurate or not very accurate, respectively (Table 1). An additional quarter of the farmers indicated they could not comment on forecasts' accuracy. When grouped into two categories—those who perceived forecasts to be mostly or always accurate and those who viewed them otherwise, farmers who used the forecasts tended to perceive them to be more accurate than the farmers who did not use them (P < .001; Suppl. Table S4). (...) Climate change appears to have influenced Zambian farmers' perceptions of forecast accuracy and weather predictability. Nearly all Zambian farmers we surveyed reported observing weather and climate changes (Table 1); only 3.9% of the farmers reported not observing at least one element of climate change. The vast majority stated that they observed declines in rainfall, and a plurality stated that they observed increases in droughts and temperatures. Additionally, most farmers perceive that predicting the weather has become more difficult. About 70% of the farmers believe that predicting both the onset of rain and in-season rain— two critical aspects of the growing season that affect production decisions—is more challenging now than in the past. The farmer observations of climate dynamics strongly relate to their perceptions of the accuracy of weather forecasts. A plurality of the farmers, 43%, believe that these changes have affected weather forecast accuracy, while another 32% were unsure. Only 25% stated that climate changes did not affect the accuracy of weather forecasts (Table 1)".
26	Climate change and variability awareness and livelihood adaptive strategies among smallholder farmers in semi-arid northern Ghana	Asante, F.; Guodaar, L.; Arimiyaw, S.	Environmental Development	2021	10.1016/j.envdev.2021.100629	"From Table 3, majority of the respondents (95.9%) had observed at least a change in one element of climate before while the remaining 4.1% had not observed any changes at all. For the respondents who had observed changes in the climate, 50.4% were from Loagri No.1, 32.2% were from Yagaba whiles the remaining 13.2% were from Soo. (...) The observation of farmers was found to be multidimensional which were manifested through protracted droughts (116 or 95.9%), unpredicted rainfall patterns (114 or 94.2%), high temperatures (120 or 99.2%), strong winds (81 or 66.9%) and frequent flood events (120 or 99.2%). These observed changes have effects on agricultural production. (...) The effects of climate change and variability on agricultural production were assessed and the results are presented in Table 5. The results show that 118 (97.5%) of the total respondents had observed changes in the rainfall pattern resulting in decreased crop output. Spatially, there was no difference among responses on the degree of effect across Loagri No 1 (50.4%), Yagaba (33.1%), and Soo (14.0%) communities. From the results, 50.4%, 33.1% and 14.0% from Loagri No.1, Yagaba and Soo respectively indicated that changing rainfall patterns resulted in decreased crop output in the study area. During the focus group discussions, it was revealed that the impact of changing rainfall in the form of delayed onset of rainfall affect crops at any stage of the production process, right from land preparation to maturity of crops such as maize, groundnuts and rice. (...) Majority of respondents (120 or 99.2%) indicated that high temperatures decrease crop production while only a single respondent (0.8%) indicated that changing temperatures lead to increased crop production (Table 5). The farmers revealed that the rising temperatures being experienced have significant negative impact on crop production especially during the germination and maturity stages. Responses on the perception of the effect of temperature on agricultural production did not vary much among the communities. Spatially, 50.4% were from Loagri No. 1, 34.7% from yagaba and 14.1% from Soo.
6	Ethnic minority farmers' perceptions and use of local knowledge to adapt to climate change: Some insights from Vietnam	Manh, N.T.; Ahmad, M.M.	Singapore Journal of Tropical Geography	2021	10.1111/sjtg.12397	"For an understanding of farmers' perceptions of overall climate change, we asked the question: 'Do you think the climate/weather has changed during the last 20 years?' We found that 91.4 per cent of the farmers perceived overall change in current weather when compared to the last 20 years, while 8.6 per cent did not perceive anychange (Table 3). This clearly shows that a small number of farmers were still oblivious to climate change. Out of the 362 respondents, 53.6 per cent of Tay farmers noticed climate change while 3.6 per cent responded otherwise; 22.9 per cent of Hmong farmers perceived climate change while 2.9 per cent did not; and approximately 14.9 per cent of Dao farmers noticed weather changes while 1.1 per cent did not. (...) Table 3 shows that 88.1 per cent of the farmers noticed increase in temperatures while 11.9 per cent did not. (...) Many respondents stated that the present weather was too hot and that summer periods seemed longer than what was experienced in the last 20 years. The farmers mentioned, 'We never used electric fans during summer season in the past; but now, without electric fans we cannot live'. (...) Only 16 per cent of farmers perceived increased and unpredictable rainfall while 84 per cent of them perceived a decreasing phenomenon. Interestingly, 84 per cent of our sample noticed that rainfall had decreased during the last 20 years when it had actually increased according to meteorological data (see Figure 2 and Table 3). (...) Table 3 shows that 64.1 per cent of farmers perceived more natural disasters when compared to the last 20 years while 35.9 per cent did not. Out of 362 samples, 37 per cent of Tay farmers noticed more natural disasters while 20.2 per cent did not. About 19.3 per cent of Hmong farmers observed more natural disasters while 7.5 per cent did not. Approximately 7.8 per cent of Dao farmers noticed more natural disasters while 8.2 per cent did not. (...) Specifically, ethnic minority farmers have been applying local knowledge to forecast the weather to help them adapt to climate change. (...) For example, farmers in Nghienloan stated: 'Living in mountainous area, we do farm based on our local knowledge'. Approximately 65.5 per cent of farmers confirmed that they knew and heard about local knowledge while 34.5 per cent did not, indicating that local knowledge is quite widespread. Moreover, we found that 60.2 per cent of the farmers reported that they applied local knowledge to adapt to climate change while 39.8 per cent did not. (...) Tables 4–5 show in detail how farmers have used indicators for weather prediction. For example, farmers perceived that when frogs croak profusely, rain would soon follow. Conversely, during periods of rainfall, they think that if termites appeared in large numbers, the rain would mostly likely stop within the hour. Farmers also claimed that when wild chickens (Ga rung) started to roost in low brushwood in the forest, storms and heavy rainfall would most likely follow. In particular, we found that farmers have been applying flora and fauna as indicators.
10	Smallholder farmers' perceptions of climate change and adaptation practices for maize production in eastern Ethiopia	Teshome, H.; Tesfaye, K.; Dechassa, N.; Tana, T.; Huber, M.	Sustainability (Switzerland)	2021	10.3390/su13179622	"All sampled households in the study district perceived at least one aspect of temperature and rainfall change (Figure 3). The majority (78%) of the interviewed households perceived increasing in temperature. However, 7% of the households perceived decrease in temperature, and the remaining ones perceived no change. A decrease in rainfall amount was also perceived by most maize farmers, whereas 10% perceived no change, and the remaining 7% perceived an increasing trend in this variable. (...) In this study, most farmers perceived increasing rainfall variability in terms of lateonset and early cessation rainfall during the main growing season (Figure 3). During the focus group discussion, farmers mentioned late-onset and early cessation of rainfall as a major factor that affects decisions on planting as well as harvesting dates. (...) The majority of farmers in the study districts responded that there was decrease in rainfall amounts and increase in the temperature in the last thirty years (Figure 3). (...) The result of the multinomial logit regressions showed that age, educational level, family size, and access to extension services were the main factors significantly influencing farmers' perception of temperature and rainfall in the study area (Table 6). (...) The majority of maize farmers were aware of climate change and variability from their own experience (Table 7). As shown in Table 4 above, the sampled households in the districts had an average farming experience of more than 20 years. (...) Almost all (about 95.3%) of maize farmers blamed deforestation as a major contributor to climate change and variability (Table 8). The remaining farmers blamed land-use change, natural phenomena, burning of fossil fuels as contributors to climate change and variability. A few other farmers attributed climate change and variability to the "Wrath of God"".
6	Land-use and climate related drivers of change in the reindeer management system in Finland: Geography of perceptions	Rasmus, S.; Wallen, H.; Turunen, M.; Landauer, M.; Tahkola, J.; Jokinen, M.;	Applied Geography	2021	10.1016/j.apgeog.2021.102501	"Perceptions on the importance of factors related to climate and weather were rather homogeneous within the whole RMA (Table S2). Cold and rainy summers were mainly perceived as a harmful factor (Fig. 4a), but in some southern districts as a beneficial one. Few districts from the central region viewed also hot summers positively, although this factor is generally considered harmful to reindeer (Rasmus, Turunen, Luomaranta, et al., 2020). Survey respondents explain how climate-related factors directly affect the welfare of the animals and, thus, the future calving success: "After a hot summer, calf production was very weak. The dams were not in heat" (Southern area); "Warm autumns led to a weak rutting period, the stags got lazy … Rutting is delayed in warm autumns. The dams need frosts to be in heat" (two herders from the southern area); "A cold winter may also cause dams to abort their calf" (Northern area).

6	Linking risk preferences and risk perceptions of climate change: A prospect theory approach	Villacis, A.H.; Alwang, J.R.; Barrera, V.	Agricultural Economics (United Kingdom)	2021	10.1111/agec.12659	"Individuals who distort probability information stated a higher CC risk perception over all the dependent variables. For example, the phenomenon of distorting probability information is associated with being 23.1% less likely to perceive the risks of climate change on output prices as being important and 23.5% more likely to perceive them as being very important. These results suggest that the incorrect assessment of probability information leads farmers to perceive the risk associated with climatic phenomena as more threatening. This phenomenon of probability distortion has a larger impact on the perceived risks of CC on crop management practices (31.4%), and a relatively smaller influence on the perceived risks of CC on the village (14.1%). Individuals with higher values of □ (curvature of the value function), that is, those who are less risk−averse, stated a lower perception of risk of CCon crop management practices. A one-unit increase in the □ scale (a decrease in the level of risk aversion), is associated with being 36.7% more likely to perceive the risk of CC on crop management practices as important and being 36.7% less likely to perceive it as very important. This result suggests that risk seeking farmers perceive CC risk as less threatening to outcomes associated with specific agricultural practices. (...) Contrary to the initial hypothesis, loss-averse individuals stated a higher perception of risk of CC to their village. Loss-averse individuals are 13.9% less likely to perceive that risks of CC to their village are important and 14.2% more likely to perceive it as very important. (...) More educated individuals state a higher perception of risk of CC to this outcome. Being older and having a higher income does not translate into a greater perception of the risks associated with CC".
6	Time-series trend analysis and farmer perceptions of rainfall and temperature in northwestern Ethiopia	Marie, M.; Yirga, F.; Haile, M.; Ehteshammajd, S.; Azadi, H.; Scheffran, J.	Environment, Development and Sustainability	2021	10.1007/s10668-020-01192-0	"As shown in Fig. 2, about 81% of the respondents perceived that the temperature is increasing in the area. This means that the large number of farmers in the study region is aware of climate change and expect a higher temperature. Although 9.1% of respondents did not note any temperature shifts, 6.6% of farmers observed a decrease in temperature, and 3.3% of farmers considered an unusual temperature trend over the past 30 years. About 78% of the respondents reported changes in rainfall patterns and a decrease in rainfall amount over the past 30 years (Table 1). This may imply that the farmers of the study area are aware of the main indicators of climate change in terms of fluctuation of the rainy period and a decrease in rainfall. About 9.1% of the respondents perceived that there was an irregular pattern of precipitation. Nearly 8% of the respondents noticed no change in the amount of rainfall. About 5% of the respondents noticed an increase in the total amount of rainfall over the past 30 years.
6	Are perception and adaptation to climate variability and change of cowpea growers in Mali gender differentiated?	Diarra, F.B.; Ouédraogo, M.; Zougmoré, R.B.; Partey, S.T.; Houessionon, P.; Mensah, A.	Environment, Development and Sustainability	2021	10.1007/s10668-021-01242-1	"A three Likert scale was used to determine farmer's perception of climate change. Table 2 presents the results of farmers' perception of climate change. It shows that farmers in Cinzana have perceived a lot of changes in their climate and environment. They have perceived some shifts in the beginning and the ending period of the rainy season. In fact, 45% of the respondents disagrees with the early beginning of the rainy season out of which 40% are women and 50% are men. Majority of respondents (62%) agree with the early ending of rainy season, while totality (100%) of the sample disagrees with the late beginning of the dry season. (...) Farmers in Cinzana perceived a decrease in rain intensity and quantity during the season. Almost 47% of women and 53% of men disagree with the increased frequency of rainy days during the season. (...) Farmers, in Cinzana area have noticed an increase of daily and night temperatures. Both women and men are perceiving changes in the day and night average temperatures. About 72% of women and 74% of men have perceived an increase in the day temperature. Similarly, 65% of women and 63% of men disagreed with the decrease in night temperature. (...) Cinzana farmers have also perceived an increase of strong wind frequency. About 61% of women and 65% of men disagree with the decreased of strong wind frequency, whereas 56% of women and 72% of men have noticed a decrease in spontaneous bushfire. (...) Farmers have also found their soil less fertile than the past ten years. About 96% of the sample reported their soil to be less fertile than 10 years ago, while almost 45% of women and 54% of men disagree with the fact that they are experiencing less soil erosion problem. (...) In general, the study found that women and men farmers have the same perception of climate change in Cinzana area. They equally perceive changes in the rainy season pattern, temperature, soil quality and extreme phenomena".
2	Using traditional agroecological knowledge to adapt to climate change and variability in the Upper East Region of Ghana	Baffour-Ata, F.; Antwi-Agyei, P.; Apawu, G.O.; Nkiaka, E.; Amoah , E.A.; Akorli, R.; Antwi, K.	Environmental Challenges	2021	10.1016/j.envc.2021.100205	"The respondents perceived rainfall and temperature changes in terms of increasing and decreasing patterns, the amounts, duration of the rainy season as well as the onset. With regards to rainfall, majority of the re- spondents (n = 79; 53%) reported a decrease in the amounts of rainfall compared to past three decades (Table 2). Furthermore, majority of them (n = 143; 95%) reported a decrease in the pattern of rainfall compared to three decades ago. About 79% of the respondents (n = 119) reported shorter rainy season nowadays compared to three decades ago. In terms of temperature, majority of the respondents (n = 110; 73%) reported a rise in temperature for the past 30 years. (...) The respondents used a combination of several traditional agroeco- logical indicators including traditional meteorological knowledge, the appearance of certain insects, birds and other organisms as well as the flowering and fruiting of certain plants or trees to predict the onset of rainfall in the study communities. Majority of the respondents (n = 110; 73%) used wind direction as a meteorological indicator to predict the onset of the rains (Table 4). This was closely followed by cloud type and colour (n = 107; 71%). Regarding indicators by animals, birds and insects, about 59% (n = 89) of the respondents used the croaking of frogs to predict the onset of the rainy season. This was followed by the appearance of the cattle egret (n = 81; 54%). In terms of indicators from phenology of plants, about 60% of the respondents (n = 90) relied on the fruiting of local trees particularly the shea nut (Vitellaria paradoxa), baobab (Adansonia digitata) and Dawadawa (Parkia biglobosa) to predict the rainfall onset. These indicators were also highlighted in the FGDs. For example, some of the focus group participants shared their experiences: "I have always relied on the local trees such as baobab, shea nut and Dawadawa to predict the farming season. The moment the shea nut for instance begins to bear fruits, I know that the rainfall season is imminent "–(Focus group participant, Gaani, July 2018) "The appearance of the cattle egret informs me that the rainy season is very near. My grandfather told me to take critical note of this when I was young and this has helped me to monitor the advent of the rainfall season" –(Focus group participant, Gia, July 2018) "There is a time that the clouds appear very close to the ground. The moment those clouds emerge and the colour of the cloud changes to black, it tells me that there is an impending heavy rainfall "–(Focus group participant, Nyangua, July 2018)".
6	Perceptions of Risks Related to Climate Change in Agroecosystems in a Semi-arid Region of Brazil	Magalhães, H.F.; Feitosa, I.S.; de Lima Araújo, E.; Albuquerque, U.P.	Human Ecology	2021	10.1007/s10745-021-00247-8	"In total, informants from the six rural communities indicated 29 risks, which were divided into four categories according to the what area they impact: agriculture (n = 7), livestock (n = 5), climate (n = 5), and socioeconomic (n=12) (Table 3). Overall, the risk that stood out most in terms of citation number was crop losses (n=83), followed by the risk of water scarcity (n = 77), and livestock losses (n=69). Informants indicated water scarcity (s=1.49), productivity losses (s=1.69), and crop losses (s=1.93) as the most severe risks. The term "productivity losses," in our understanding, means financial income loss related to agricultural production loss. Hence, we catego_x0002_rize it as a socioeconomic risk (Table 3). (...) The only variable that was a predictor for the perception of risks by the informants was length of experience in agriculture combined with previous experience with risks (z = 2,253, p = 0.0267) (Table 1). Almost half of our informants (46.8%) had only elementary education, followed by those who had no schooling (30.85%), and those who had completed high school (19.3%). Regarding years of experience in agriculture and previous experience with risks, we obtained averages of 34.1 and 4.04 for those with elementary education and those with no education, respectively. We obtained an average of 4.85 for number of risks perceived by farmers. (...) We obtained an average of 14.77 for number of citations of the risks perceived and of 5.2 for the severity attributed to them".
6	Comparative Analysis of Meteorological Records of Climate Variability and Farmers' Perceptions in Sekota Woreda, Ethiopia	Behailu, G.; Ayal, D.Y.; Zeleke, T.T.; Ture, K.; Bantider, A.	Climate Services	2021	10.1016/j.cliser.2021.100239	"Table 3 illustrated the opinion of sample household respondents about specific indicators of climate variability and extremes. Great majority of farmers perceived the rise of their locality temperature (97.6%) and reduction of rainfall (99.4). Beside, respondents have observed the erratic nature of rainfall distribution in their locality. For instance about 95.2% and 98.2% of responses were aware of the late onset of rainfall and early cessation of rainfall. About 93% of respondents felt the strengthening of wind, 100% of the sample households felt drought become more frequent. (...) Key informants and FGD participants felt the rise of night time (minimum) and day time (maximum) temperatures. They were well aware of the decline of rainfall in amount and reliability for the last 20 years. Unlike the meteorological rainfall trend analysis they underlined that the summer rainfall in their locality has been remarkably reduced since two decades. They felt the adverse impact of recurrent drought and reduction of rainfall on their crop and livestock production. Climate variability created favorable condition for the propagation of new insets and pests to the area. It also facilitated soil erosion and hence, reduction of soil fertility. Rise of temperature and reduction of rainfall also reduced land suitability for crop production. For instance, before two decades they used to grow crops like barley, wheat, teff, maize, and beans. However, now days it is impossible to produce barely and beans. It seems the rise of temperature and disturbance of rainfall and distribution behavior hindered crop production and distributed the agro-ecological of the study sites. (...) Farmers also anticipate the rise of minimum and maximum temperature, reduction and more erratic rainfall in the future. All categories of respondents attributed the occurrence of drought to the punishment of God for their acts.(...) Elders (72%) followed by adults (36%) were certain about the rise of temperature, reduction of rainfall and erratic nature of rainfall distribution. Relatively, early young (21%) and young (24%) respondents were less certain of climate variability and extreme events in their locality".
6	Exploring climate change adaptation practices and household food security in the Middle Eastern context: a case of small family farms in Central Bekaa, Lebanon	Al Dirani, A.; Abebe, G.K.; Bahn, R.A.; Martiniello, G.; Bashour, I.	Food Security	2021	10.1007/s12571-021-01188-2	"Study participants believed that climate change is occurring and caused by human activities (48%) or by a combination of natural changes in the environment and human activities (37%) such as bush burning, deforestation, and pollution. In terms of changes in rainfall and temperature patterns over the past 20 years, the overwhelming majority perceived an increase in temperature and a decrease in precipitation, rainfall frequency, and length of the rainfall seasons. (...) This suggests that smallholder farmers recognize that climate change is a serious problem affecting family farms in Lebanon".

10	Smallholder Farmers' perception and adaptation to climate variability and change in Fincha sub-basin of the Upper Blue Nile River Basin of Ethiopia	Tessema, I.; Simane, B.	GeoJournal	2021	10.1007/s10708-020-10159-7	"Of the different climatic change parameters, respondents asked about their observations of local changes in temperature, precipitation, and climatic extreme events (drought and flooding) over the past two decades. In terms of temperature changes, about 92.9% (standard deviation of 6.6% among agroecosystems) of the total respondents perceived that the temperature has increased with significant difference among households in the four agro-ecosystems. In terms of total annual rainfall 87.9% (standard deviation of 11.5% among agro-ecosystems) of the total respondents perceived that, the total annual rainfall has decreased with significantly different at 1% level of significance across agro-ecosystems. About 88.7% believed that there is overall change in seasonality of rainfall; 85.6% experience drought extreme weather event; and 87.9% experience flooding extreme weather events in the past 20 years (Table 4). Findings from focus group discussions and key informant interview also substantiate the information from survey results. The findings of focus group discussion summarized below. FGD in AES: As we heard from our forefathers and even in the past as elders mentioned, it is clear that the rain was so generous. Temperature increasing year by year, the rain usually used to come on time and rarely interrupts in a season, and the recurrence of drought increased. (...) Regarding rainfall, the discussants raised different views: all participants agreed the change in rainfall pattern but there are diverse views among the participants in overall amount of rainfall. Some argued total annual amount increased and many others said decreased. The difference is mostly associated with the variation in agro-ecosystem. (...) Table 4 presents respondents' observation of climate variability and change impact on crop and livestock production in the study sub-basin. Though there are variations among AES, more than 85% of farmers had observed decline in length of growing period during the main Kiremt season. (...) With statistically significant differences among the AES, about 41.6% of total respondents reported decline in water availability, while 39% believed that there was more variability in water availability. Similarly, about 79% of respondents observed an increased incidence of crop damaged by disease, 93% respondents observed an increase incidence of crop damage by insects and pests, and 96% respondents observed the severity of weed infestation in crop fields as one of the manifestations of climate variability and change. As farmers confirmed during FGDs and KIIs, though, the problems of agricultural crop diseases, insects, pests, and weeds are an already existing problem in the study area; it is aggravated and increased in incidence over the past 20 years. With a statistically significant difference among the AES, about 68% of respondents reported an increase in the incidence of livestock diseases and the rest (32%) observed no change in the occurrence of livestock diseases. During FGDs, shortage of livestock-feed raised as one major problem and farmers agreed, as the problem is shortage of grazing land rather than climate change."
6	Perceived Vulnerability and Climate Change Impacts on Small-Scale Fisheries in Davao Gulf, Philippines	Macusi, E.D.; Camaso, K.L.; Barboza, A.; Macusi, E.S.	Frontiers in Marine Science	2021	10.3389/fmars.2021.597385	"When statements concerning climate change (shown in Table 2), were presented to the fishers, most of them replied that they have observed a change in weather patterns and increase in sealevel rise due to higher frequency and intensity (87%). This was followed by an increased prevalence of typhoons (86%) that bring flooding and destruction. A generally hotter temperature (83%) was also observed. This was perceived as an impact especially during summer months and less frequent during the onset of the rainy season. In contrast, flooding (76%) is considered unpredictable when there is sudden prolonged rain even in the summer. The lack of credit access (59%) also affects the fishers because they need financial assistance for vessel and gear replacement as well as for starting capital during fishing days. When the onset of rainy days or typhoons occur, some could not fish causing them to experience inadequate food (45%). Only 41% of the respondents mentioned observing destruction and bleaching of coral reefs. The majority of fishers observed that their usual catch has decreased (94%) as a recognized impact of climate change (Table 3). This was the main reason why many fishers tend to venture farther offshore (88%) in order to catch more fish.
6	Regional mapping of climate variability index and identifying socio-economic factors influencing farmer's perception in Bangladesh	Rabbi, S.E.; Shant, R.; Karmakar, S.; Habib, A.; Kropp, J.P.	Environment, Development and Sustainability	2021	10.1007/s10668-020-01104-2	"In response to the question, "Have you experienced any climatic variability in your locality since last 10 years", 92% farmers replied 'Yes' (15,126), 5.98% farmers replied 'No' (927) and 1.74% farmers replied "don't know" (285) (Table 1). (...) Result showed that 90% male perceived the changes in climate whereas a mere 9% female agreed with similar identifications. The average family size was 4.5 and 67% respondents who perceived the climatic variability belonged to family size of 4–6 persons. According to farmer's category, result showed that landless farmers perceived the changes most (50%) and marginal farmers (34%) shared similar perceptions. Almost 55% respondents having monthly income 10,001–25,000 taka reported positive perceptions on climatic variability. About 33% of farmers who completed primary education perceived climate variability whereas 35% of farmers who completed secondary education reported the same. However, the respondents mean year of education was class 5. About 17% respondent having access to credit reported that they perceived climatic variability. Likewise, 38% respondents having access to television and 96% respondents having access to mobile expressed their positive opinion on climatic variability in their respective localities. (...) the farmers were asked about "what were the climatic variabilities they were observing for the last 10 years in their respective localities?" Primarily, the respondents reported 10 climatic variabilities, namely temperature, rainfall, seasonal variation, drought, flooding, early flooding, thunderstorm, storm (Northwesters and Cyclone), salinity, fog and smog. Initially, 7 individual maps were prepared to enumerate which climatic variability was mostly observed by the local farmers in which localities. (...) Among different socio-economic factors, result revealed that gender, family size, education, farmer's category, credit availability and access to television had significantly increased the likelihood of farmer's perception of climatic variabilities ($p < 0.01$). The probability of perception significantly ($p < 0.01$) increased by 17% among the male farmers than those of the female. The probability of perception significantly decreased by 10% with the increased household size. Findings exposed that one grade increase in level of education had significantly decreased the probability of perception regarding climatic variabilities among the local farmers. A scrupulous focus on the farm size showed that the perception of climatic variabilities increased significantly with the increase or expansion of the farm size. Findings also revealed that the probability of perception increased by 15% with access to credit. (...) Findings revealed that male respondents significantly reported that their livelihoods were affected due to the change of climate by 27% than those of female respondents. The marginal effect for farmer's education clarified that with the increase of educational grade decreased the probability of experiencing the impact of climatic variabilities on livelihoods significantly by 13–14% for signing knowledge, primary and secondary education. Moreover, result showed that the probability of experiencing the climatic variabilities on livelihoods increased significantly with the increase or expansion of the farm size for marginal farmers by 45% and for small and medium farmers by 48%. Findings also demonstrated that one unit increase in income significantly decreased the probability of experiencing the impact of climate change on livelihoods. Likewise, the probability of experiencing the variability increased ($p < 0.10$) if the farmer received any credit. In contrast, the probability of experiencing the climate impact increased by 11% if the farmers did not have access to television".
27	Pathways of Climate Change Impact on Agroforestry, Food Consumption Pattern, and Dietary Diversity Among Indigenous Subsistence Farmers of Sauria Paharia Tribal Community of India: A Mixed Methods Study	Ghosh-Jerath, S.; Kapoor, R.; Ghosh, U.; Singh, A.; Downs, S.; Fanzo, J.	Frontiers in Sustainable Food Systems	2021	10.3389/fsufs.2021.667297	"During the FGDs, the respondents reported changes in the local weather pattern which manifested as declining rainfall trends over the past two decades as well as irregular rainfall followed by long dry spells. Some also reported witnessing strong wind and thunderstorms during the monsoon season. As shared by one respondent: "Water which used to fall (in rain), was sufficient, but now it doesn't rain that much, and even if it rains, it rains in the wrong season, it comes with lightning and in fact the rain is less and lightning is more" (Respondent number 2, female, study village two, Sunderpahari block), while another respondent stated: "There is very less rainfall now, because of that there is drought in the village" (Respondent number 1, male, study village two, Boarijor Block). (...) According to FGD respondents, variations in local weather conditions are impacting their agricultural practices and kitchen garden produce".
6	Farm households' perceptions and adaptation strategies to climate change risks and their determinants: Evidence from Raya Azebo district, Ethiopia	Sertse, S.F.; Khan, N.A.; Shah, A.A.; Liu, Y.; Naqvi, S.A.A.	International Journal of Disaster Risk Reduction	2021	10.1016/j.ijdrr.2021.102255	"Following previous studies [36,37], households' were asked about their observation regarding the changes in temperature and rainfall over the last two decades. (...) In terms of household perception, the results (Fig. 3) show that out of the surveyed households, 99% of households reported a decline in rainfall (overall), 97% indicated a rise in temperature (overall), and 96% mentioned the occurrence of off-seasonal rainfall as the key indicators of changes in the study area. (...) In terms of climate associated risks, 98% of households indicated an increase in drought occurrence, 90% of household stated an increase in pest and disease attacks, 41% indicated wind storms, and 34% described floods as the key challenge associated with climate change and are becoming frequent and sever in the area. It is evident that the majority of sampled respondents were mainly concerned about precipitation variability, which constrains agricultural production and hence their food security. (...) Our findings show that climate change-induced hazards and production risks are largely increased in the study area, and farmers' livelihoods, which are primarily related to agriculture, could be exposed to a higher level of susceptibility to these risks. Specifically, farmers' indication of a significant increase in droughts is worrisome since the majority of the population in the study area relies on rainfall for the cultivation of cereal crops and sustain their food security".
10	Supporting indigenous adaptation in a changing climate: Insights from the stó:Lō research and resource management centre (British Columbia) and the fort apache heritage foundation (Arizona)	Gauer, V.H.; Schaepe, D.M.; Welch ,J.R.	Elementa	2021	10.1525/elementa.2020.00164	"Sto´:lo participants consistently reported observing a decline in Fraser River salmonid populations and reduced availability and health of traditional plants and medicines in the territory, such as western-red cedar (Thuja plicata) and wild berries. It is unclear whether impacts to traditional plants are attributable to global climate change. Changes to the Fraser River, such as warmer river temperatures, lower water levels, more variable water levels, and lower water quality, were also consistently reported. Other observations included warmer and drier summers, reduced snowfall, and perceptions of increased risk of floods and wildfires".

10	Water quality threats, perceptions of climate change and behavioral responses among farmers in the ethiopian rift valley	Godebo, T.R.; Jeuland, M.A.; Paul, C.J.; Belachew, D.L.; McCornick P.G.	Climate	2021	10.3390/cli9060092	"Most farmers reported in the survey that lack of rain is one of the main constraints to agricultural productivity. Many also indicated that they thought rainfall was becoming more erratic. Figure 5 shows farmers' perceptions of changes in the pattern of rainfall and temperature. More than 70% of the farmers stated that rain comes and stops later than expected, compared to ten years ago. Moreover, a majority perceives that the climate is drier, hotter, less predictable and generally worse for farming than it used to be, especially in lowland areas. A few farmers (6%) report no changes in temperature and rain. Despite perceptions of more erratic precipitation, some farmers report that their farm output is improving due to their use of improved seeds and fertilizers. (...) In focus groups, it was noted that farmers were generally aware that changes to the cmate are becoming a serious problem. These changes are widely perceived as being related to rainfall variability (rain comes too early and stops too late, and is uneven in amount, whether too high or too low), and farmers in the Rift especially reported experiencing a significant reduction in overall rainfall, alongside extreme and unexpected, rare heavy rainfall episodes. In the highlands, complaints were primarily related to variability, rather than to the quantity of rainfall. Due to rainfall shortage in the Rift, farmers start planting drought-tolerant early maturing maize varieties, though there is limited supply of such seeds. In some cases when there has been no rainfall in April and May, farmers forgo planting entirely. Maize productivity is also decreasing from time to time; however, farmers are achieving enhanced returns by shifting to wheat, barley and teff cultivation".
6	How do agro-pastoralists cope with climate change? The case of the Nyangatom in the Lower Omo Valley of Ethiopia	Gebeyehu, A.K.; Snelder, D.; Sonneveld, B.; Abbink, J.	Journal of Arid Environments	2021	10.1016/j.jaridenv.2021.104485	"Table 3 presents the households' perceptions of climate change impacts. In all qebeles, most interviewed agro-pastoralists perceived an increasing temperature (86%) and longer duration of the dry season (84%). Similarly, about 84% of the respondents perceived a decrease in rainfall amount, including more frequent drought (76%), late-onset (86%), and early cessation of rain (86%). Most households (92%) reported a negative impact of climate change on the availability of livestock fodder. According to 78.5% of the respondents, livestock number is reduced because of droughts. Increased animal diseases (83%) and conflicts with neighbouring ethnic groups (27%) were other important factors that affect livestock productivity. A change in land use was identified by only 1% as a reason for the decrease in pasture productivity and increased fodder shortage. Furthermore, many of the agro-pastoralists (89%) indicated climate change as a major factor that affects crop productivity, specifically lack of rain (33%) and unpredictability of rainy seasons (23%). Additionally, crop diseases (21%), land fragmentation, and moving into less productive lands (17%) were mentioned as reasons for crop yield reduction. Declining water availability (68%) were also reported as the important impacts of climate change".
10	Determinants of farmers' adaptation decisions to climate change in the central coastal region of Vietnam	Vo, H.H.; Mizunoya, T.; Nguyen, C.D.	Asia-Pacific Journal of Regional Science	2021	10.1007/s41685-020-00181-5	"To understand changes in the local climate, the interviewees were asked about whether they have perceived any changes in temperature, precipitation, typhoon, flood, and saline intrusion in the past 10 years. The results are summarized in Table 3. The change in annual temperature was pointed out by 80.91% of respondents. Among them, most (75.45%) perceived the increase in the annual temperature. Of which, more than a quarter (26.36%) visibly felt the rise of temperature over the past 10 years. The rise of temperature is a notable trend in the Summer–Autumn crop, which was confirmed by nearly 80% of the study population. Meanwhile, more than half of the respondents (60.9%) reported the normality of temperature in the Winter–Spring crop. Conversely, about one-fifth of those interviewed (23.64%) believed that the temperature tends to increase in the mentioned season. Besides, several farmers further stated that the dry season seems to come earlier, and the high temperature lasts longer in comparison with the previous. (...) In terms of precipitation, farmers basically perceived a downward trend. Of the study population, 72.73% noted the decrease in annual rainfall, of which up to 32.73% affirmed a substantial degree. Only 19.09% of informants felt stable. In addition, the decline of precipitation in both main crops was reported by 43.6% and 78.2% of participants, respectively. Relating to other extreme phenomena, the majority of respondents (78.2%) perceived the rise of typhoons, while 66.3% of them emphasized the decline of floods. However, despite the downward trend of floods, some households still complained about the increasing irregularity of floods in recent years, which makes anticipating by conventional approaches less effective. (...) Regarding the saline intrusion, normal status was affirmed by the majority of the study population (61.82%). More than one-third (38.18%) of farmers, however, stressed the increasing aggravation of this phenomenon in the recent decade".
2	Comparing farmers' perceptions of climate change with meteorological trends and examining farm adaptation measures in hazard-prone districts of northwest Bangladesh	Roy, D.; Datta, A.; Kuwornu, J.K.M.; Zulfiqar, F.	Environment, Development and Sustainability	2021	10.1007/s10668-020-00989-3	"Farmers' perceptions of CC in the study areas are presented in Fig. 5. Most of the respondents in both areas (Kurigram: 67.46% and Nilphamari: 57.94%) perceived an increase in summer temperature. In the FGDs, the participants mentioned summer temperature as unbearable during the last two decades. An increase in the length of summer days was reported in both areas. In both areas, bulk of the respondents perceived a delayed rainfall usually after the rainy season (76.19% and 44.44% in Kurigram and Nilphamari, respectively). The participants of the FGDs mentioned that sometimes they need to wait for rainfall to start due to this scenario, but most of them transplanted their rice crops using groundwater pumped through shallow tube well and deep tube well. A total of 66.67% and 84.92% of the respondents in Kurigram and Nilphamari, respectively, perceived a decreasing intensity in rainfall in the past 20 years. Similarly, a majority of the respondents in both areas experienced lower number of rainy days during the same period (73.81% and 88.89% in Kurigram and Nilphamari, respectively). Results obtained from the FGDs revealed that due to delayed and erratic rainfall and decreased rainfall intensity, the study areas often face drought conditions during the crop-growing season. An overwhelming 93.65% of the respondents in both areas perceived a decreased length of winter days in the past 20 years. Majority of the respondents (43.65%) in Kurigram perceived an increase in flood, whereas majority of them (40.48%) perceived no change in the flood situation during the past 20 years in Nilphamari. More than four-fifths of the respondents in Kurigram and Nilphamari perceived an increased intensity of drought (82.54% and 87.30%, respectively) in the past 20 years. Regarding riverbank erosion, 40.48% of the respondents in Kurigram perceived an increase, while 46.02% of the respondents in Nilphamari experienced no change during the past 20 years. A total of 84.13% and 76.98% of the respondents in Kurigram and Nilphamari, respectively, perceived an increased occurrence of natural hazards".
6	Enhancing socioeconomic resilience and climate adaptation through value chain development of mountain products in Hindu Kush Himalayas	Baig, S.M.; Khan, A.A.; Ali, A.; Khan, M.Z.; Ahmed, S.; Shah, G.M.; Ali, G.	Environment, Development and Sustainability	2021	10.1007/s10668-020-00975-9	"Most respondents (i.e., 79.06%) in the sample have the perception that environmental changes/climate changes impact their household monthly income as presented in Fig. 2. When respondents were asked to highlight the main factors that impact their household income, 36% respondents in the sample held natural disasters responsible for affecting households' monthly income by disturbing the routine productivity. And 31% respondents consider that the climate change impacts are major cause of change in monthly income as presented in Table 2. (...) When asked whether the respondents have ever heard and talk about climate change, 71% of the respondents in Gojal-I and Gojal-II union councils have had heard about climate change and 61% of the sample respondents were able to talk about the effects of climate change correctly. Likewise, in Phander and Teru union councils these percentages were 64% and 49%, respectively, as shown in Fig. 3. (...) Majority of the respondents in the sample suggest that the temperature pattern in the area has been changing in all the sampled Union Councils (Fig. 6). With respect to tendency of temperature, majority of respondents perceived relatively cooler & extended summers (71% in Phander and Teru and 69% in Gojal-I & Gojal-II) and sudden cooler exposures in shorter winters (62% in Phander and Teru and 65 in Gojal-I & Gojal-II)".

2	Indigenous adaptation to climate change risks in northern Ghana	Guodaar, L.; Bardsley, D.K.; Suh, J.	Climatic Change	2021	10.1007/s10584-021-03128-7	"Smallholder farmers in northern Ghana perceive that they are experiencing more variable rainfall, increased temperature and more extreme climate events (see Table 2). Most of the 299 respondents, (93.0%) identified prolonged drought as the major climate risk experienced over the last few decades. Severe drought events were recognised as becoming more regular across each of the study districts, Nandom (93.8%), Savelugu (94.3%) and Bongo (90.8%). This finding was emphasised during the focus group discussion when a female participant at Bogorogo in Bongo said: 'Drought is our major problem as farmers in this community and the situation is worse during the dry season'. Erratic rainfall was reported by most respondents (92.0%) as the second most important climate risk they have been experiencing. However, there were some statistically significant differences ($F = 8.21$; $p < 0.05$) in respondents' answers across the study districts. More respondents at Savelugu (96.6%) and Bongo (94.7%) perceived of increasingly erratic rainfall than those at Nandom (82.7%), perhaps because the latter is further to the west with less rainfall variability (Nkrumah et al. 2014). Also, a large proportion of respondents (89%) perceived increases in temperatures, but again results varied significantly ($F = 5.12$; $p < 0.05$) across the districts, with respondents at Savelugu (95.4%) and Nandom (91.4%) more likely to perceive temperature increases than those at Bongo (82.4%). (...) A large proportion of respondents (70.9%) observed more frequent flood events, but that observation varied significantly across the study districts ($F = 17.70$; $p < 0.05$) with more observations at Savelugu (88.5%) and Bongo (73.3%) than at Nandom (50.6%). Farmers at Savelugu expressed concern about more regular flooding in the region during the focus group discussions. A male participant at Kpalung in Savelugu said that: 'Every year we are confronted with flooding issues, and yet nothing is done about it. Last year, for example, I lost all my crops and livestock due to flooding during the rainy season'. A large proportion of respondents (88.0%) also perceived more frequent wildfires, although the level of observation varied only slightly across the districts, Nandom (91.4%), Savelugu (89.7%) and Bongo (84.7%). The smallholder farmers reported that climate change impacts were having significant impacts on their farming activities. Almost all respondents (97.0%) reported that their cropping calendar had been disrupted due to increasingly erratic rainfall regimes, which make it increasingly difficult to predict patterns. A male participant from Kpalung in Savelugu noted that: 'It is now difficult to predict when the rains will fall. This has forced me to adjust my planting calendar'. Most respondents (95.0%) perceived that the multiple climatic stressors have resulted in decreased crop productivity. Many of the respondents mentioned that due to the rainfall uncertainties and extreme climate events, the seasonal crop output of their dryland systems has been declining in recent years. A large proportion of respondents (90.9%) also perceived that climate change has intensified incidences of crop diseases and pests. Farmers particularly highlighted the increasing fall armyworm (Spodoptera frugiperda) infestations, which affect their productivity. Reflecting on this issue, a male farmer at Dua Nayire in Bongo said that: 'The fall armyworms have been destroying my maize farm. When they attack the crops, they feed on the seeds and destroy them. Last year, the pests destroyed half of my oneacre maize farm'. Most respondents (89.0%) mentioned that they had experienced loss and damage to crops as a result of wildfire or flood events. That experience of respondents varied significantly ($F = 9.76$; $p < 0.05$) across the study districts with more respondents at Nandom (97.5%) perceiving crop losses than in Savelugu (93.1%) and Bongo (92.4%) districts, perhaps because respondents in Nandom experience particularly strong winds and wildfires, which can destroy crops. (...) Farmers, again particularly at Savelugu, voiced concerns about perennial flood impacts during focus group discussions. A male participant from Nabogu said that: 'One major problem for us is the floods, which occur every year and destroy our farms. When the Bagri dam is opened upstream, the problem becomes more severe'. Most respondents (84.9%) perceived that one or more crop species have disappeared due to the changing climatic conditions, although there were some statistically significant differences ($F = 8.25$; $p < 0.05$) in responses across the study districts. For instance, a higher percentage of respondents in Nandom (91.0%) and Savelugu (93.0%) perceived the loss of crops than those at Bongo (76.0%)".

11	Integrating local perceptions with scientific evidence to understand climate change variability in northern Ghana: A mixed-methods approach	Guodaar, L.; Bardsley, D.K.; Suh, J.	Applied Geography	2021	10.1016/j.apgeog.2021.102440	"Almost all respondents perceived of temperature and rainfall changes (Table 2). Increased average maximum temperatures were perceived by majority of respondents (89%) in all the study districts (Table 2). Spatially, there was a statistically significant difference ($p < 0.05$) between respondents who perceived of increased temperatures in the districts of Nandom (91.3%), Savelugu (95.4%) and Bongo (83.2%). Nevertheless, 11% of the 299 total respondents disagreed with that perception. In relation to minimum temperatures, the majority of farmhouseholds (80%) generally perceived of increased minimum temperatures with spatial distributions of 85.2%, 87.3% and 71.8% in the Nandom, Savelugu and Bongo districts respectively. Many participants in the FGDs agreed that they had experienced increased temperatures over the last couple of decades. For instance, a 56-year male participant at Nandom had this to say: "In the olden days, day and night temperatures were not as high as we are experiencing nowadays. We used to experience high temperatures in the dry season, but now we are in the rainy season and you cannot even imagine the heat" (FGD, 2019). A similar experience was reported by a 70-year female participant at Savelugu: "Day and night temperatures as well as temperatures in the rainy and dry seasons have intensified in recent years. In the day time, it is difficult to walk through the sun and in the night the rooms become very warm" (FGD, 2019). A 69-year female participant at Bongo had a particular reflection on the heat, stating that: "The rate of increasing temperatures has been very rapid. Now the sun rises with very high intensity. We now feel the scorching of the sun very early in the morning-a situation which was never the case in those days. Sometimes, it is very difficult to even describe the extreme nature of the temperature. The heat from the sun mostly continues for a longer period of time before it subsides" (FGD, 2019). About 75.3% of respondents perceived that annual rainfall had decreased (Table 2), although again there were some statistically significant differences ($p < 0.05$) in respondents' responses across the study districts. For instance, a larger group of respondents in Savelugu (87.4%) perceived of decreased rainfall than those in Nandom (71.6%) and Bongo (69.4%). Similar observations regarding rainfall trends were made during the FGDs and expert interviews. For instance, a 55-year female participant at Nandom stated that: "I have observed that the rains don't fall like they used to, especially in the dry season. The amount of rainfall in the dry season has reduced considerably in recent years compared to 50 years ago. During the rainy season where regular rainfall is expected, it rains two or three days and stops for some time before it rains again. Sometimes, the rain stops for a whole month and suddenly falls torrentially on a particular day" (FGD, 2019). Similarly, a 50-year male participant at Bongo said that: "Generally, rainfall amounts continuously to decrease, especially in the dry season. The rains are not falling as they used to 40 years ago when I was a kid. In recent years, it rains for a shorter duration and the amount is not that much as compared to the olden days" (Interview, 2019). However, an agricultural extension agent at Bongo was of the view that rainfall had intensified in recent years, especially during the rainy season. As observed by an agricultural agent in one of the communities. "I think the amounts of rainfall these days are not as much as twenty years ago. However, what I have observed over the years is that the intensity of the rainfall has intensified with more destructive effects, especially during the peak of the rainy season (September–October)" (Interview, 2019). The study further assessed perceptions of some specific seasonal changes in the study districts (Table 3). From the survey, 91.9% of the household heads generally agreed that the seasonal rainfall regime had become erratic. There was a significant difference ($p < 0.05$) in such perceptions across the study districts, as a larger proportion of respondents in Savelugu (96.6%) agreed that rainfall was becoming more erratic, followed by Bongo (94.7%) and Nandom (82.7%). FGD and interview respondents had similar perceptions of erratic rainfall. For instance, a 74-year male participant at Savelugu observed that: "The rainfall has been on and off in recent times. It used not to be the case in the prior three to four decades. The time we expect the rains to come for us to plant doesn't happen any longer. The rain doesn't come at the right time for us to plant. However, in the sixth or seventh month the rain will come very heavily such that the soil will be socked and if you plant the seed, germination becomes a problem" (FGD, 2019). Also, a large group of surveyed respondents (93.3%) perceived that there was a late onset of the rainy season, with similar findings in Bongo (94.6%), Savelugu (93.1%) and Nandom (91.4%). Coupled with the late arrival of the rains, a majority of respondents (79.1%) observed the more regular, early termination of the rainy season. This observation varied significantly ($p < 0.05$) across the study districts with a large group of respondents at Nandom (87.7%) perceiving an early termination of the rainy season, than Bongo (78.6%) and Savelugu (71.3%). Particularly, there were growing concerns amongst respondents in FGDs and interviews about the late onset and early termination of rainfall. A 72-year female participant at Nandom stated that: "The rainfall season starts late nowadays and ceases very early. In recent years there has been a shift of the rainy season from April to June and early ceasing from November to October. This has reduced the days of our planting season, making us alter the entire cropping calendar" (FGD, 2019). Similarly, a traditional community leader at Nandom in an interview in one of the villages indicated that: "Our farmers, including myself, have had to change our cropping calendar and system in recent years. We are doing so because of the late start and early cessation of the rainy season. We now face uncertainties in predicting when to start planting our crops" (Interview, 2019). Most respondents agreed that they were experiencing more extreme climate events in their districts (Table 4). A large majority of respondents (92.7%) perceived of more prolonged and/or severe droughts across the study districts, with similar perceptions in Bongo (90.8%), Nandom (93.8%) and Savelugu (94.2%). The general perception of droughts across the study districts could be explained by the manifestation and impacts of high temperatures and evapotranspiration and more variable rainfall, which increasingly characterises the regions of northern Ghana (Yaro & Tsikata, 2013). A 59-year male participant at Savelugu in one of the discussions indicated that: "There has been long period of drought. The droughts we experience these days have intensified with high frequency and severity making it literally impossible for crop and livestock farmers to cope. In fact, the patterns of droughts have changed remarkably in the last 50 years. I have observed that the droughts are no longer occurring the time they used to occur. The birigu sansali (sowing droughts) have shifted forward while the kpagla sansali (flowering droughts) have shifted backwards. The early shedding of leaves of the Sinsaba and kparega trees indicate the extreme and severe nature of droughts in this community" (FGD, 2019). Frequent floods were perceived by a majority of respondents (71.3%), but that perception varied spatially, with significantly greater perceptions ($p < 0.05$) in Savelugu (88.8%) than Bongo (72.5%) and Nandom (50.6%). More frequent wildfires were perceived among a majority of respondents (88%) across the districts, with Nandom (91.3%), Savelugu (89.7%) and Bongo (84.7%). These quantitative findings of extreme events were supported during discussions. For instance, at Savelugu a 79-year male participant said that: "Floods are more frequent in the rainy season with severe impacts. Even though we used to experience floods in this community some years back, what we are experiencing now is an extreme case where the floods could engulf an entire building without seeing the roof. The situation becomes more severe when the Bagri Dam is opened upstream in Burkina Faso. During the peak of the rainy season in August, there are high incidences of floods in many communities in the district. The few and narrow drainage systems in the communities are unable to cope with the large amounts of the running water with its inherent high velocity making it more destructive" (FGD, 2019). Harmattan winds were found to be severe in all the study districts as well. Though a majority of respondents (83%) generally perceived severe harmattan winds in northern Ghana, the level of perception varied significantly ($p < 0.05$) across the districts, Savelugu (92%), Bongo (79.4%) and Nandom (79%). A 60-year female participant at Nandom noted that: "The harmattan winds have become very severe in recent years with more dryness and dustiness. Before the year 1980s, the harmattan was normal and many children could even walk bare chested, but now children cannot do that because of the severity of the harmattan winds. The winds have become so severe that if you don't cover yourself well you may get pneumonia. Also, in those days, the harmattan winds were not strong as compared to what we are experiencing in recent years. I also think in recent years, the harmattan winds develop earlier than some years ago. Now, we sometimes experience the harmattan winds as early as October" (FGD, 2019). According to 60.3 percent of majority of respondents, heatwaves were intensifying in northern Ghana, with statistically significant ($p <0.05$) variation across the study districts, Savelugu (80.5%) followed by Nandom (76.6%) and Bongo (36.7%). Globally, higher temperatures are suggested as one of the factors accounting for the extreme heatwaves experienced in many Sahelian countries of SSA (Barbier et al., 2018). Participants in the FGDs perceived similar developments, and at Bongo a 66-year female participant explained that: "The heat that accompanies the harmattan winds is sometimes indescribable. The winds are so hot in the dry season when temperatures are very high. During this period, it becomes very difficult to go about our daily activities in the communities" (FGD, 2019). A large proportion of respondents (70.9%) perceived that severe rainstorms were coming more regularly in their locality, with similar
6	Farm Households' Adoption of Climate-smart Practices in Subsistence Agriculture: Evidence from Northern Togo	Ali, E.	Environmental Management	2021	10.1007/s00267-021-01436-3	"CC is a phenomenon that is observed in Northern Togo (Table 2). Farm households in the study areas are aware of CC and its harmful effects on farming activities. An investigation into farmers' experience on eventual changes in rainfall or temperature patterns in the previous two decades was conducted. The results show that farmers in the sample are well aware of the changing patterns in precipitation and temperature over the years. Specifically, 99.15% of respondents have experienced a decrease in rainfall, while 99.57% have experienced an increase in temperature. About 99.86% of respondents have observed a shift in the rainy season during the past two decades. Moreover, 98.58% of respondents claimed that not only does the rainy season often start late, but it also ends earlier than usual (Table 2). Most respondents opined that the frequency of violent wind (73.01%), increase in the frequency of severe dry spells (96.85%), and high temperature (98.44%) are the main reasons for crop failure in the study areas. At least 42.05% of respondents believe that crop failure during the last decade may be due to an increase in the frequency of flood events".
6	Farmers' perception on climate extremes and their coping mechanism: Evidences from disaster prone regions of India	Kanwal, V.; Sirohi, S.; Chand, P.	Indian Journal of Traditional Knowledge	2021		"Fairly a large section of sample households (43.4%) in Bikaner revealed that they have experienced high incidences of drought in the last 10 years. Contrary to this, households of Kota stated that they have either not experienced the drought (76.7%) or experienced low intensity drought. (...) Around 30% of population in Bikaner reported that they have never experienced rainfall anomaly in the past 10 years while only 2.2% of sample households denied the incidence of rainfall anomaly in the flood-prone region. (...) A majority of households (90%) in the drought-prone region perceived that they have never experienced heat waves. (...) Around 58% of sample households in Bikaner and 62% in Kota perceived that wind-storms and hail-storms causes medium to high risk in regions. (...) The results are in consonance with these facts as around 43.3% of households in Bikaner responded that they have never experienced pest and disease infestation in crops while in Kota this proportion of household was merely 6.7%. Just 5.5% of sample households in Bikaner and 28.8% in Kota experienced fewer incidences of risks in crops due to pest and diseases. Around 27.7% and 43.3% of sample households said that they realized medium incidences of pest and disease infestation of crops in Bikaner and Kota, respectively. The proportion of population realizing high incidence of this risk was almost equal in Bikaner (23.5%) and Kota (21.5%). Besides that, the pest and disease infestation among livestock was also a common phenomenon among cattle bearers of both the places. A majority of livestock holders realized high incidence of this risk in Bikaner while this proportion was only 7.8% in Kota. (...) Focus Group Discussion (hereafter; FGD) revealed that most of the time community anticipates in advance; weather it is going to be an abundant or deficit year. Appearances of many colorful butterfly implies onset of abundant rainfall in the regions. Appearances of ants and termites in masses also indicate the same. Elders in villages also reported that on the advent of abundant rainfall there appear lush greenery and heavy flowering on some tree species such as ficus and acacia. Change in wind direction, movement of stars and clouds also dictate about the abundance or scarcity of rainfall in the region".

6	Farmers' perceptions about changes in climate variables: Perceived risks and household responses in different agro-ecological communities, Southern Ethiopia	Dendir, Z.; Simane, B.	Climate Services	2021	10.1016/j.cliser.2021.100236	"A four-point Likert scale of the agreement about farmers' perceptions about climate change and related extreme events is presented in Table 1. The study revealed that the majority of the respondents interviewed in different agro-ecologies had observed declining precipitation. However, the result was varied between the agroecological zones. Farmers in the lowland perceived more decline (81.3%) in rainfall than those in highland (69.9%) and midland (56.4%) agro-ecologies. Respondents from each of the agroecologies reported an increasing trend in temperature. A higher proportion (90.7%) from the lowland perceived that temperature had increased compared to 81.9% and 78.6% in highland and midland, respectively. (...) In addition, respondents indicated that they observed an increased occurrence of extreme climate events during the most recent years. Regarding the occurrence of droughts, 86.9% of respondents from the lowland agroecology believed that the frequency of drought had increased, which was higher than both midland and highland agroecologies. Similarly, respondents in the different agro-ecologies suggested that the frequency of flood, frost, and the storm had increased (Table 1). Respondents from each of the agro-ecologies reported that rainfallhas become more irregular in frequency, timing, and intensity. During focus group discussions, particularly in lowland agroecology, participants mentioned that rainfall would typically come in June up to September, but nowadays it has been coming irregularly and water reservoirs have been drying up early in the season due to insufficient rains and high evaporation. (...) Farmer's perceived that the frequency and intensity of extreme weather events have increased in different agroecological zones of the study area. During the discussion with farmers in different agroecologies, both climatic and socio-economic stressors were recognized as the main factors influencing agricultural activities. Farmers in each agro-ecologies mentioned both climate and nonclimate stressors which adversely affect their agricultural production, particularly on crop production (Fig. 2). Droughts, floods, frost, erratic rainfall, storms and pests, and diseases were mentioned by the respondents as main climate-related stressors that affect their crop production. Farmers in the lowland agroecology reported that erratic rainfall patterns (80%) and drought (49.3%) were the main climate-related stressors that affect their crop production. Participants in FGD also mentioned that after the occurrence of drought they were not able to prepare their land for the next season. Moreover, lack of irrigation is sighted as an aggravating factor for their vulnerability to the effect of rainfall irregularity. Erratic rainfall patterns (80%) and pest and disease (30.2%) were reported as the main climate-related stressors in the midland agroecology. During the FGD discussion, participants mentioned due to climate change it is difficult to predict weather conditions to perform agricultural activities using indigenous knowledge. About 67.7% and 48.1% of respondents in the household survey cited erratic rainfall patterns and frost were the main climate-related stressors in the highland agro-ecologies. The small size of agricultural land, labor shortage, lack of agricultural inputs, and lack of credit service were reported as the major nonclimatic stressors influencing agricultural activity in different agroecologies of the study area. Farmers in the lowland agroecology perceived labor shortage (70.7%), land shortage (52%), and lack of seeds (46.7%) were the major non-climate stressors. Land shortage (77.3%), lack of seeds (65.1.), and labor shortage (57.1%) were listed as major non-climate stressors in midland agroecology as showed in Fig. 2. Respondents in highland agroecology perceived that land shortage (73.7%), lack of credit (60.3%), and lack of seeds (57.9%) were among the main non-climate stressors to their farming activities. Focus group participants in different agro-ecologies attributed labor shortages to youth's migration to urban areas".
2	Assessing Livelihood Vulnerability of Farmers' in Backward Regions of India	Singh, S.	Indian Journal of Agricultura	2021	10.18805/IJARe.A-5413	"It is observed that more than 90% of the farmers experienced climate-induced events, viz., the summer season becomes more-hotter, increase in frequencies of drought events and the decline in the water table (Table 1). Further, more than 70% in the Jalaun district and 50% in Jhansi district, farmers perceived that rainfall has declined. In totality, it was observed that climatic factors are exposing to the farmers' livelihood".
29	Smallholder farmers' perception of climate change and adoption of climate smart agriculture practices in Masaba South Sub-county, Kisii, Kenya	Nyang'au, J.O.; Mohamed, J.H.; Mango, N.; Makate, C.; Wangeci, A.N.	Heliyon	2021	10.1016/j.heliyon.2021.e06789	"The results indicate most farmers perceived a decrease in rainfall over time with only 10.2% and 1.5% noting an increase and no change in rainfall amounts respectively (Figure 3). There was a significant difference among respondents regarding perceived changes in the amount of rainfall over time ($p < 0.000$). A significant number of households indicated that the rainfall distribution was poor, with only 2.6% who noted insignificant change within the seasons. A significant difference among the respondents reported that the onset of rainfall was late than the contrary ($p < 0.000$). The changes in the onset of rainfall resulted in the disruption of the farmers' seasonal calendar that was equally perceived to be short (Figure 3). (...) The temperature was perceived to have increased over the years by 76.6% of the respondents. A significant difference between those who observed an increase in temperature and those who perceived either a decrease or no change was noted (Figure 5). The smallholder farmers claimed the increase in temperature had resulted in the drying of some crops in some seasons".
6	Climate change observations of indigenous communities in the Indian Himalaya	Negi, V.S.; Thakur, S.; Dhyani, R.; Bhatt, I.D.; Rawal, R.S.	Weather, Climate, and Society	2021	10.1175/WCAS-D-20-0077.1	"Analysis of data obtained from the questionnaire survey reveals that the majority of respondents (.97%) of all age groups have perceived notable changes in local climatic conditions during last three decades. (...) Major examples cited by local people (including perceptions of key informants) are provided in the online supplemental material (Table S2). The results of key informants also validated the data obtained from the questionnaire survey. For instance, 100% of the key informants agreed that climate is changing and cited examples of increasing temperature and erratic rainfall. Those in the ,40 age group gave descriptive narrations of past events that they have obviously not experienced personally but had learned from their grandparents. Respondents of age group 40–60 cited many examples of climate change in their surroundings, while respondents . 60 years of age narrated the details of differences between past and present conditions. A slightly greater majority (96.4%) of respondents in the higher-altitude regions perceived an increase in temperature compared to midaltitude villages (94.5%), but the difference was not significant (z 5 0.36, df 5 1, and p 5 0.644). The people of midaltitude villages perceived significantly more erratic rainfall when compared with those in high-altitude villages (z56.14, df5 1, and p,0.0001).High-altitude villages still experience snowfall, and the respondents from these villages did not perceive a reduction in snowfall as was the case with midaltitude respondents; the difference was significant (z 5 2.48, df 5 1, and p 5 0.01). Significantly more people in midaltitude villages reported drying in spring as compared with respondents from higher altitude (z5 8.38, df 5 1, and p , 0.0001). The proportion test also confirmed significant differences in crop yield between mid- and high altitude regions, that is, midaltitude villages have experienced significant declines in crop yield as compared with higher-altitude villages (z5 7.64, df 5 1, and p , 0.0001). A larger proportion of people in midaltitude villages reported an increase in pests and diseases as compared with respondents from higher altitudes (z5 7.33, df 5 1, and p , 0.0001). Significant differences (z 5 12.33, df 5 1, and p , 0.0001) in drought incidences were perceived by the mid- and high-altitude respondents".
6	Climate change risk perceptions and agricultural adaptation strategies in vulnerable riverine char islands of Bangladesh	Ahmed, Z.; Guha, G.S.; Shew, A.M.; Alam, G.M.M.	Land Use Policy	2021	10.1016/j.landusepol.2021.105295	"As we know from the recent data and incidents that climate change is one of the greatest threats to life on earth, but when it comes to individual level evaluation, in our case the farm household level, then char dwellers' climate change risk perceptions vary greatly from one to another (Whitmarsh, 2011). (...) In our study, we have used a similar type of Likert scale to measure char dwellers' risk perception regarding climate change. In this regard, the CCRPS and SCCRPI were calculated to elicit a better understanding of how char dwellers perceive risks associate with climate change. From Eq. (1), we calculated the CCRPS on 16 climatic events which ranged from 25 to 277 (lowest value 0 to highest value 294). After analyzing the range of the CCRPS value, we simply cannot tell whether char dwellers are sensitive to the risk of climate change on average, rather we can say that char dwellers have low to medium levels of sensitivity for the last four climatic events (value 25 to value 87) and medium to high levels of sensitivity for the remaining the climatic events (value 140 to value 277). However, from the SCCRPI, we can see that the values varied substantially ranging from 8.50 to 94.22 which illustrates that char dwellers perception categories are heterogeneous. However, most of the char dwellers belong to medium to high perception index values (47.62–94.22) and less belong to low and medium perception index values (8.50–29.59). From the focus group discussion, we found that the index value we calculated for each climatic event matches with char dwellers cumulative responses. (...) The following table shows the climate change risk perception of char dwellers by some 16 predetermined climatic events along with their score and index value (Table 3). After calculating the respective score and index value for each climatic event, we ranked them from 1 to 16 for better understanding and interpretation. From the SCCRPI we found that drought, river erosion, flood, crop pests, outbreak of several diseases, heavy fog and extreme temperature during summer and winter are the major climatic risks perceived by the char dwellers".
10	Perception of indigenous people of climate change and its impact on the Everest National Nature Preserve	Shijin, Wang	Meteorological Applications	2021	10.1002/met.1987	"Residents exhibited stronger perceptions for climate change (average perception strength = 3.64), yet relatively low strengths for both the water environment and eco-environment (perception strengths of 2.21 and 2.52, respectively) (see Table A1 in Appendix A), presumably because these factors are relatively difficult to recognize directly. The survey suggests that most residents perceive climate and water environment changes in the ENNP. More than 85% of respondents either agreed or strongly agreed that warming and glacier and snow cover retreat are obvious and solar radiation has been enhanced significantly. Fewer than 80% agreed that the frequency of extreme weather and continuous drought events has increased, while nearly 90% of respondents think precipitation has decreased significantly. Over 70% of respondents degreed that runoff has decreased. Overall, the most frequently described personal experiences of global warming reflected their concerns about climate change. (...) However, 52.4% of respondents were unsure whether ecosystems were degraded; half of respondents agreed that plant diseases and insects were more fearsome; and only 23.81% of respondents agreed that grasslands were facing serious desertification, degeneration and salinization. In addition, 69.05% of respondents thought that the rapidly reduced ice and snow landscape had affected their cultural structure and spiritual world (Q21), while most respondents held uncertain or opposed attitudes. The residents' perceptions were not consistent with climate and water environment changes and their direct impacts, indicating that their perspectives were affected due to the pessimism and worry from climate and environment change, and they lacked understanding and knowledge about the impacts of climate and water environmental changes (see Table A1 in Appendix A)".

6	Drought responses and adaptation strategies to climate change by pastoralists in the semi-arid area, Laikipia County, Kenya	Ndiritu, S.W.	Mitigation and Adaptation Strategies for Global Change	2021	10.1007/s11027-021-09949-2	"All pastoralists in the study area perceive that rainfall and temperature have changed in the region because it has become more unpredictable to forecast the seasons. (...) Despite the government and development partners efforts to promote early warning messages for climate risk to households through NDMA, IGAD Climate Prediction & Applications Centre (ICPAC), FEWS NET (the Famine Early Warning Systems Network), and Kenya Meteorological Department (KMD), only 33% of the households received early warning messages in the study area. There was a higher number of reported dry spells than the number of droughts reported for the last 15 years. On average, pastoralists perceived that the two droughts affected their livestock while four dry spells affected the livestock with a high variation of 5 dry spells. All the households reported having lost livestock due to frequent, severe droughts. The main consequences of droughts are loss of livestock and poor livestock quality leading to fewer sales and incomes. (...) We find a significant negative influence of the perceived delay in rain seasons on the storage of fodder (Table 3, column 2). On the other hand, the increase in the perceived frequency of droughts significantly drives pastoralist to increase the frequency of mobility but negatively influence the storage of fodder (Table 3, columns 1 and 2). The results reveal that perceived climate extremes (droughts and longer dry spells) do increase climate change adaptation.".
6	Climate variability, land cover changes and livelihoods of communities on the fringes of bobiri forest reserve, Ghana	Baffour-Ata, F.; Antwi-Agyei, P.; Nkiaka, E.	Forests	2021	10.3390/f12030278	"Although most of the local people in the communities did not understand the science of climate variability, nevertheless, they had knowledge on the impacts of increasing temperature and rainfall variability. The perception of the rural communities on precipitation and temperature trends is shown in Table 5. A sizeable number of the respondents had knowledge of climate variability issues. For the purpose of this study, climatic changes were limited to alterations of precipitation and temperature pattern that have marked the study area for the past years. In terms of rainfall, 290 of the respondents (72.5%) perceived that there were changes in the onset of rainfall. Some of the respondents (27.5%) perceived no changes in the onset of rainfall. One hundred and two respondents (25.5%) perceived rainfall to be increasing. The majority of the respondents, 74.5%, perceived rainfall to be decreasing. With regard to temperature, the majority of the respondents (91.5%) perceived that temperature kept on increasing with only a few of the respondents (8.5%) perceiving temperature to be decreasing. Regarding the causes of climate variability, 349 (87.3%) of the respondents perceived that anthropogenic activities (for example, overlogging and bush fires) were the main causes of the changing climate. Twenty-four (6.0%) attributed the phenomenon to natural occurrence, while 17 (4.3%) and 10 (2.5%) of the respondents said the cause of changing climate is a punishment by God and signs of the end of time respectively. The order of the causes of climate variability did not differ significantly by gender as both males and females perceived overlogging and signs of the end of time as the greatest and least causes of climate variability respectively (Table 6). (...) Results from key informant interviews also suggested that reduced rainfall amounts together with increasing temperatures in the study area could be implicated in the increasing conversion of undisturbed forest into grassland and other land cover types."
6	Causes, indicators and impacts of climate change: understanding the public discourse in Goat based agro-pastoral livelihood zone, Ethiopia	Mihiretu, A.; Okoyo, E.N.; Lemma, T.	Heliyon	2021	10.1016/j.heliyon.2021.e06529	"To assess the farmers' overall climate change perception, a question aimed to identify whether they perceived or not was forwarded. In view of that, 86.5% of them were claimed changes in climate but the rest were denied changes across the study decades (Table 2). (...) Farmers' climate change perception further studied by disaggregating respondents in to different age groups, sex category and education status. (...) Out of total respondents (86.5%) who perceived climate change, 62.6% and 77.8% were male-headed and illiterate household heads, respectively. The $\chi 2$ result in Table 2 shows that significant difference among 5.8%, 74.2% and 6.5% respondents who were in young, adult and elder age groups (p 0.05). Respondents, found in the adult age were better perceived climate change compared to those who were in young and elder age clusters. This is may be because as age increases, the farmers would become extra likely to access and acquire knowledge from different sources. (...) The farmers who reported changes in climate were again asked about the patterns in annual temperature and rainfall, thus 76.8%, 7.1% and 16.1% of them were perceived an increasing, decreasing and constant trend of temperature, respectively in the study years. On disaggregated level, 76.8% revealed that temperature is rising since the last three decades, of which 58.9% and 69.2% were illiterate and male-headed (Table 2). The $\chi 2$ result displayed a statistically significant difference among age groups; hence, 66.1% of farmers found in adult age were perceived an increasing temperature (p 0.01). This infers that dissimilarity in temperature perception among age groups was not a chance factor, rather it may be due to young and elder farmers are less likely to recall the long-term climate trend and have less exposure to climate information. (...) n the study, among farmers who perceived the climate change, 61.6% were witnessed recurrent rainfall variability across years, but 7.5% and 30.8% of them were with 'no variability' and 'I don't know' responses, respectively (Table 2). More specifically, rainfall variability was better perceived by male, adult and literate farmers in descending order. The $\chi 2$ test discovered that respondents who were adult and literate perceived the rainfall variability at a significant level as they are likely to realize the variation using academic knowledge that they are blessed with ($p < 0.05$) (...). To understand how perception was differed within similar awareness group, respondents' opinion on the causes, indicators and impacts of climate change were assessed through classifying in to two groups. Based on Table 2, among the perceived respondents, 76.8%, 83.5% and 61.7% were respectively witnessed an increasing temperature, decreasing rainfall and variability consistent with the trends of meteorological records, hence this group was defined as climate change adopters. However, from the perceived respondents, 7.1%, 2.2% and 7.5% were respectively observed a decreasing temperature, increasing rainfall and no variability, on top of 'no change' (30.4%) and 'I don't know' (30.8%) responses, this group was on the other hand defined as a non-adaptor group. (...) As portrayed in Table 4, respondents who were classified as adopter were perceived a high rate of deforestation, increased natural resource depletion, poor soil and water management experience and fastest population growth as climate change causes in their descending order. On the other hand, fastest population growth, increased natural resource depletion, poor soil and water management experience and higher rate of deforestation in ascending order were important causes of climate change identified by non-adaptor farmers group. The $\chi 2$ test also indicated that except high rate of deforestation and poor soil and water management experience, there was significant variation among adaptor and non-adaptor farmers in their perception levels to the climate change causes ($p =< 0.05$). (...) The FGDs participants' opinion on climate change causes is summarized as follows: "The most important climate change causes in the study district were mainly human made. Deforestation, natural resource degradation and the growing population were hence among the others" (Summarized from FGDs). (...) The combined Likert scale revealed that shortage of rainfall, an increased temperature, erratic rainfall, recurrent drought and short rainy season in descending order were agreed indicators of climate change by the adaptor group. Nevertheless, for non-adaptor respondents the perceived climate change indicators were frequent drought, higher temperature, erratic rainfall, shortage of rainfall and short rainy season in descending order (Table 5). Most respondents in the adaptor group were provided an account that rainfall was showed a downward trend while temperature was increasing across the study decades, hence the district is getting heater as compared to the preceded decades. The $\chi 2$ test also revealed that except to frequent drought and short rainy season, there were statistically significant variations between climate change adapter and non-adapter respondent groups ($p =< 0.05$). The study also discovered that the drought frequency in the district used to be in 5/6 years interval, but these days it occurs within 3/4 years interval. (...) Farmers' associate the climate change impacts with agricultural production decline hence decline in crop yield, diminishing livestock productivity as well as livestock and human diseases outbreaks were identified as top three climate change impacts by adaptor farmers (Table 6). On the other hand, crop yield decline, livestock and human diseases occurrence, livestock production decline, higher livestock death, water reduction and conflict for resource competition in descending order were the major climate change impacts identified by non-adaptor farmers. "

6	Measurements meet human observations: integrating distinctive ways of knowing in the Pamir Mountains of Tajikistan to assess local climate change	Haag, I.; Kassam, K.-A.; Senftl, T.; Zandler, H.; Samimi, C.	Climatic Change	2021	10.1007/s10584-021-02988-3	"In Roshorv, the community members reached very strong consent regarding decreasing levels of snow (dFC of -0.82). Moderate agreement was reached in terms of increasing autumn and winter temperatures, decreasing levels of rain, and a delay in the timing of snow onset. In Savnob, moderate consent was reached for decreasing levels of snow and rain (dFC of -0.5) and increasing temperatures in winter (dFC of 0.5). Whereas changes in weather and climate are often not directly visible, community members explain their perceptions by ecological or sociocultural indicators and impacts. In Savnob and Roshorv, indicators were identified in regard to agriculture, infrastructure, natural environment and daily routines. Indicators mentioned three or more times in the interviews are listed in Fig. 4. Indicators reported in both villages include an earlier time of harvest, earlier start of fieldwork, decreasing demand for heating resources, earlier melting of snow, and a more comfortable feeling because of warmer temperatures. “In the past, we harvested later. Sometimes it took us until October. Now, we finish our harvest in September. Wheat, barley, and beans have ripened at that time.” (R13, 2019). In Roshorv, conflicting observations were made about the availability of water, which is provided to the village by a glacier-fed stream. According to eight respondents, there is less water in the stream resulting in insufficient water availability for irrigation. However, four other respondents stated a sufficient water supply for irrigation. Regardless its effects on agriculture and irrigation, community members independently reported less water in the stream and a decrease in the size of the glacier above the village. Concerning the communities’ infrastructure, people in Roshorv explained that their roads and paths are less blocked by snow in winter, due to shrinking levels of snow. “Since the 1980s snow is becoming less and less. Before the 1990s we had to clean the roads to Gudara and Savnob every winter. Now, cars can drive there without having to clean the road first.” (R17, 2019). Decreasing amounts of snow have also been reported in the villages of Savnob. People remember that in earlier times they spread sand on the snow to hasten the melting process. Although, nature-based communities have learnt over generations to anticipate changes in weather and climate, community members frequently mentioned enhanced variability in the weather. Annual fluctuations in the timing of plant blossoming and field fruit maturity have been mentioned as indicators for increased weather variability. Additionally, three people directly reported that the weather is getting more variable and the seasons more unpredictable. At no time, people associated anthropogenic climate change as a potential cause behind their experienced impacts. Instead, people argued that their perception of changes in weather and climate might rather be influenced by their age, health, ecological profession, beliefs, changes in machinery, or availability of heating resources. “We feel that it is getting warmer. An explanation is that in the past we had community farms (Kolkhoz) and state farms (Sovkhoz) and not everyone had to work on the fields. Maybe after this period we started feeling the heat because more people became farmers and had to work on the fields again. However, people started to become farmers in 1991 [after collapse of the Soviet Union and during the civil war] and we started to feel that it is getting warmer around 1995/1998.” (R5, 2019)".
6	Climate change and variability perceptions and adaptations of pastoralists’ communities in the Maasai Steppe, Tanzania	Nnko, H.J.; Gwakisa, P.S.; Ngonyoka, A.; Estes, A.	Journal of Arid Environments	2021	10.1016/j.jaridenv.2020.104337	"To understand if peoples’ perception of climate change was powered by cognitions, respondents were asked if their awareness of technical term “climate change”. 52.2%, (n = 136) knew about the existence of the concept but majority of them (92%, n = 71) could not explain what it was. When respondents were asked to characterize climate pattern in their area for the last 30 years based on their own experience, 94.4%, (n= 136) said that temperature has increased, 91.2% (n = 136) mentioned recurring drought becoming common and 88.2%, (n = 136) insufficient rainfall with spatial-temporal variation. In focus group discussion, participants were asked about historic profile of rainfall (both average and spatial-temporal variability) and temperature with reference to four political regimes in Tanzania There was a consensus among the participants that rainfall has generally decreased (Table 2) and it is becoming more unpredictable in terms of space and timing. Subsequently, there was also a consensus that use of traditional weather calendar has become less useful because of its often faulty forecasts in rainfall pattern. There was a consensus among participants that temperature has generally increased over the last four political regimes. It was pointed out that because of temperature raise; pasture availability is worsening some plant species has disappeared. Respondents also pointed out non-climate changes co-occurring with changes in climate pattern in their areas. These changes were increasing sedentarization (99%, (n = 136), emergent of new livestock disease (94.9%, n = 136), dry-out of natural water ponds (89%, n = 136), decrease of pasture quality (87.5%, n = 136) and decrease in herd size per household (66.2, n = 136). Impacts of climate change, particularly prolonged drought were; decline of livestock productivity, death of livestock and inter and intracommunity conflicts (Fig. 2)".
6	Perceptions of Climate Variability and Soil Fertility Management Choices Among Smallholder Farmers in Northern Ghana	Martey, E.; Kuwornu, J.K.M.	Ecological Economics	2021	10.1016/j.ecolecon.2020.106870	"Farmers' perceptions of climate variability and shocks are presented in Table 3. The data reveals that 58% of the sampled farmers are aware of climate change. The numbers are higher in Upper West Region relative to Northern and Upper East regions. Long-term change in mean temperature (96%), rainfall (97%), and experience of flood and drought (57%) were the most frequently cited climate variability and shocks. These perception and shock variables are statistically significant across the three regions with Upper West recording the highest number. (...) Comparing the response of farmers' perceptions of long-term change in annual temperature and rainfall to the observed annual rainfall and temperature, we found each of the two measurements to be consistent. Temperatures are increasing, and rainfall are highly variable, and many farmers perceive temperature and rainfall differently now than previously. (...) Climate shocks and perceptions of climate variability have heterogeneous effects on the choice of soil fertility management options. Farmers who have experienced either droughts or floods in the past 10 years (column one) complement crop residue with green manure, compost, and mulch. Mineral fertilizer complements green manure. However, crop residue and mineral fertilizer are used as substitutes suggesting that there is a trade-off between these two practices. The highest complementarity association (0.301) is between compost and mulch. A unique complementarity association between crop residue and mulch is recorded by farmers who have experienced droughts and floods in the past 10 years. Farmers who are aware of climate change (column two), do not have a unique combination of ISFM practices aside the general combinations of practices that is common to all the farmers. Farmers who report having experienced long-term change in mean temperature (column three) combine crop residue with compost as complements while green manure is complemented with compost. The highest complementary association (0.479) is between crop residue and green manure. Similarly, farmers who report having experienced long-term change in mean rainfall (column four) recorded the highest complementary association (0.501) between crop residue and green manure. The complementary association between green manure and compost is unique to farmers who have experienced both long-term change in mean temperature and rainfall. [...] Apart from long-term change in mean temperature, all the perceptions of climate variability and shocks variables are negatively associated with the intensity of adoption of ISFM practices”.

6	Smallholder farmers' perceptions and knowledge on climate variability and perceived effects in vulnerable rural communities in the Offinso Municipality, Ghana	Appiah, D.O.; Guodaar, L.	Environmental Development	2021	10.1016/j.envdev.2021.100691	"Farmers were asked to indicate their perceptions and experiences of climate variability to determine their exposure to climatic risks in the study area. The results show that rural farming households and communities in Offinso Municipality are exposed to multiple climatic risks. About 30.6% of respondents were highly perceptive of observed changes in rainfall characteristics in the study area. This corroborated the consensus by participants of the FGDs who generally acknowledged that changes in rainfall is their major concern. For instance, a male participant in the Ayensua community indicated that: "Many of the farmers in this Municipality depend mainly on rainfall for our farming activities. Therefore, the changes in rainfall significantly affect our crop yield and incomes. Irrigation is something that can help us, especially during the dry season but successive governments have failed in building sustainable irrigation technologies for us to engage in dry season farming." (FGD, 2017). This was followed by 22.2% of respondents who claimed to have observed all the variables (rainfall, temperature, strong winds and floods). Also, 21.2% of respondents indicated they have observed changes in the temperature characteristics while 15.8% indicated they have observed both changes in rainfall and temperature characteristics. A low proportion of respondents indicated that they have observed strong winds (8.8%) and frequent flooding (1.3%) in that order, in their local environment. The results further show that while seasonal changes in rainfall characteristics were highly perceptive among the male (23.2%) respondents, changes in temperature characteristics were highly perceptive among the female (9.4%) respondents in the study area suggesting the need for a gender consideration in climate variability and Change (CVC) discourse and policy (see Table 3). The perceived understanding of the effect of climate variability was used to assess the level of the farmers' knowledge and therefore their ability to fashion out strategies to deal with adversities associated with the problem. Respondents indicated variously on the Likert scale of very good to very poor. In response, a large majority of respondents (54%) indicated good knowledge, 19% claimed they have very good knowledge while 18% indicated poor knowledge with only 2% of them responding very poor knowledge about the phenomenon (see Table 4). During the FGDs participants explained how their level of knowledge has improved in recent years. A male participant indicated that: "Now there is nothing hidden under the sun. The many radio stations in the country have become a very useful tool in providing relevant information to us, especially when it comes to what we should do to deal with the situation. Many of the issues they discuss on radio and televisions, nowadays, focus on climate variability which helps us to understand the phenomenon very well. The media educate us on how we contribute to these bad changes and the steps we can take in our little way to help reduce the risks associated with it" (FGD, 2017). Also, a female participant said that: "Due to the changes in climate, the amount of rainfall has reduced because of the late-onset and early stoppage of the rains. Also, when it rains heavily especially when the temperatures rise very high in the day time, flooding becomes our reward. In view of these dynamics, our planting calendars have altered" (FGD, 2017). A Pearson's Chi-square test results from the survey show that there is a significant relationship ($\chi2 = 49.583$, $p < 0.000$) between the farmers' level of education and the knowledge on climate variability. Out of the total sample of 178, 99 (57%) of the farmers with JHS/MSLC had Good Knowledge about climate variability. Thirty-one (18%) also had Very Good Knowledge about the phenomenon, while 14 (8%), had poor knowledge. Also, 24 (14%) and five (3%) respectively did not know anything at all to very poor knowledge about the effect. Also, 11 (85%) of those with tertiary education had good to very good knowledge of climate variability (see Table 5). The results further show a significant relationship ($\chi2 = 36.254$, $p < 0.000$) between farmers' level of knowledge on climate variability and their farming experiences (see Table 5). The older the farmer is in terms of his/her experiences, the better his knowledge of the phenomena. Most of them with more than 11 years of farming experience as indicated seemed to have good to very good knowledge of climate variability. Half of the respondents, 29 (50%) with 3–5 years of farming experience had a good knowledge of climate variability. Also, a relatively high number of respondents, 61 (43%) and 67 (48%) of the farmers with more than eleven years of farming experiences had very good and Good knowledge respectively, while 15 (20%) respondents with farming experiences from 6 to 11 years also had good knowledge. Among the smallholder farmers, various causes were given as to what constitutes human activities that have affected local climates to vary or change over the past fifteen years. Out of the total sample surveyed, a large proportion (45%) of the respondents identified deforestation through the wanton vegetation removal by the expansion of farmlands as well as the activities of illegal chainsaw operation as the principal drivers of climate variability in the study area. They stressed that they used to previously enjoy adequate rainfall, but due to the high rate of deforestation which others rely on as their source of livelihood, and for building purposes, the seasonal rainfall pattern has changed. Also, there was 17% of respondents who attributed the cause of climate variability to both the removal of vegetation and bush burning, especially during the preparation of land for cultivation. Moreover, 14% of the respondents conjectured that the changing climatic condition is a result of the sins of humankind, for which God is punishing humanity. This was not surprising as most religious believers, especially Christians usually ascribe human happenings to Supernatural forces, particularly in the African context. There were 11% of respondents who opined that all the responses are applicable and equally important in causing the varying changes in climate in the municipality. The next important driver of climate variability as perceived by respondents was bush burning (8%) followed by industrial emissions (3%) and vehicular emissions (2%) (see Table 6). The results further show that a large proportion of male (37.3%) respondents perceived vegetation removal as the major anthropogenic driver of climate variability while a large proportion of females (9.3%) perceived sins committed by humankind as the main cause of climate variability in the study area (see Table 6). The various perspectives of farmers on the drivers of climate variability were re-echoed during one of the female focus group discussions. It was retorted by an experienced farmer at Adukro who had been farming for over two decades that: "A very long time ago, I could predict whether it would rain or not, but the situation is different because of the indiscipline act of chainsaw operators who cut down trees for their financial gains but fail to replace them. In fact, if the government doesn't enforce the laws, the rainfall will become more variable in the near future" (FGD, 2017)".
10	Climate change stressors affecting household food security among Kimandi-Wanyaga smallholder farmers in Murang'a County, Kenya	Ngure, M.W.; Wandiga, S.O.; Olago, D.O.; Oriaso, S.O.	Open Agriculture	2021	10.1515/opag-2021-0042	"Approximately 91% of the study respondents reported that they had observed changes in local rainfall and 72.2% reported an increase in drought frequency during the period 1984–2014. The majority of respondents (72.2%) also reported rise in drought frequency. One KI reiterated that: "Here in this area, rains have reduced and we have been staying for long periods of time without rains compared to what used to happen long ago. This has made our animals to lack food. Our tea and crop harvests have also gone down." About 75.3% of the study respondents also reported a decrease in floods frequency. One FGD participant added that: "Here we don't get floods because our land has many hills. When it rains heavily, our farms which area near the rivers get flooded and this covers our crops such as vegetables and arrowroots (Xanthosoma sagittifolium)." Approximately 79.4% of the study respondents indicated that they had noted a decrease in adequacy of rainfall during crop growing seasons, while about 77.2% of the respondents perceived reduction in rainfall intensity. The FGDs participants noted that sometimes the rains were heavy, while other times they were very light and below crops needs. One KI added that: "In the past, rainfall used to be plentiful and predictable such that we knew when to dig our farms and when to plant our crops. Nowadays, we are not sure when it will rain. If we plant crops at the beginning of rains, most of the rains fall quickly and end quickly making the days we have rains to be few compared to what used happen a long time ago. Sometimes the rains stop when crops are still growing making our crops to give low harvests. Sometimes all our crops dry up due to lack of rains."(...) About 59.8% of respondents reported that local temperatures were rising temperatures. The FGDs participants concurred that temperatures had become unpredictable citing that, in the past, July that was the coldest month of the year had become warmer, while the month of August that used to be warm had become the coldest month of the year. One elderly KI opined that: "Our usual crop planting times have really changed. Temperatures have changed a lot. We cannot tell when it will be warm or cold or when the cold season will start or end. Sometimes it gets too hot while other times it gets too cold. A day can start warmand end up very cold. Sometimes it's too hot that our crops dry out."""
10	Socio-economic determinants of smallholder mixed crop-livestock farmers' choice of climate change adaptation in the drylands of Northern Ethiopia	Menghistu, H.T.; Tesfay, G.; Abraha, A.Z.; Mawcha, G.T.	International Journal of Climate Change Strategies and Management	2021	10.1108/IJCCSM-09-2020-0099	"In the present study, 81.7% of the respondents perceived CC and/or CV. In a univariable binary logistic regression, explanatory variables such as district, sex of household head, major source of livelihood, non-farm income, land ownership, landholding size, frequency of contact with extension and/or veterinarians, HH income, TLU, age and HH size showed statistically significant variation in the perception of farmers on CC and/or CV ($p < 0.05$). However, in the reduced multivariable logistic regression analysis only variables such as household size, HH income and frequency of contact with extension agents and/or veterinarians showed statistically significant variation regarding the perception of farmers. Frequent contact with extension agents and/or veterinarians increases the awareness of farmers on CC by 4.7 times. Though HH income showed a statistically significant variation in the perception of farmers, the likelihood difference for each unit increase in HH income was very small. For every unit increase in HH size, the awareness of farmers increased by 68% (Table S5). The mean predicted probability of the model was 0.194, and percent correctly predicted by the model was 91.1%. (...) Of the farmers, who were aware of CC and/or CV, 87.6% of them indicated the direct impacts of CC and/or CV on livestock production and productivity. The impact of CC and/or CV on milk reduction and weight loss were ranked top by 98.7 and 80.9% of the farmers, respectively, as very high and high (Figure 3). In addition, 91.4%, 90.8% and 86.9% of the farmers, respectively, indicated high temperature, irregularity and shortage in rainfall pattern and animal feed shortage as major indicators for the impacts of CC and/or CV. Moreover, frequent animal disease outbreak was also indicated by 78.2% of the respondents as the major impact of CC and/or CV. According to the respondents, the species of animals highly affected because of CC and/or CV were cattle (59.1%) followed by sheep (28.5%). The least species affected were camel (0 %) and goats (3.36%)".

6	Adaptive livelihood strategies among small-scale fishing households to climate change-related stressors in Central Coast Vietnam	Huynh, P.T.A.; Le, N.D.; Le, S.T.H.; Tran, T.N.	International Journal of Climate Change Strategies and	2021	10.1108/IJCCSM-04-2020-0034	"The second perceived stressor severely affecting local fishing activities included the variation and change in climate variables (Figure 2). In the group discussions, local respondents stressed that temperature was clearly hotter and hotter, rainfall became more fluctuated toward decreasing, storms happened unpredictably and severely than ever. These changes were perceived to affect fishing-related livelihoods in different ways. For instance, due to hot temperature, local fishers could not go for fishing for a longer time than usual or they had to go for fishing at the early or late time of the day. The unpredicted presence of storm when fishers were boat fishing out in the water was really harmful for fishing equipment and labours. Local respondents stated that the change in climate variables was among the key causes of the decrease in fish abundance at the sea. (...) These results showed that people in the study areas well perceived the visibility of nonclimate and climate stressors and their impacts on local fishery-based livelihoods in complicated ways".
10	Smallholder farmers' perception of climate change and adaptation strategy choices in Central Ethiopia	Addis, Y.; Abirdew, S.	International Journal of Climate Change Strategies and Management	2021	10.1108/IJCCSM-09-2020-0096	"Smallholder farmers were not directly examined on what they perceive toward climate change, rather they were asked about what they had observed the trend of the main climate indicators, particularly rainfall, temperature and drought for the past two decades. The result confirmed changes in raining time and rainfall problem had observed in the past two decades, such as about 49.41% perceive rainfall amount had decreased, about 4.71% perceive as it had increased, about 18.53% had not observed the trend and about 27.35% perceive rainfall as it had remained the same. Furthermore, they revealed an onset rainfall problem (51.18%), rained after the perceived time (42.06%), cessation rainfall problem (71.18%) and end up before the perceived time (61.18%) (Figure 1). For this reason, smallholder farmers have been challenged by unpredictable rainfall nature as crop farming largely depends on rainfall. Thus, pre-production, pre-harvest and post-harvest production activities depend on rainfall characteristics and, in turn, determines overall farm-level productivity. In the past two decades, smallholder farmers of Central Ethiopia perceived and observed temperature variability and change, such as about 71.98% of the respondents perceive as the temperature had increased, about 4.42% as it had decreased, about 27.35% revealed as it had unchanged and about 18.53% of respondents not observed the change. Also, the study considered drought as an important climatic indicator variable and about 69.41% of the respondents confirmed the frequent occurrence of drought, but about 43.24% and 6.18% of the respondents perceived the frequency of drought occurrence as decreased and remained unchanged, respectively. The remaining 17.65% had no clear information about temperature change (Figure 2). The result indicated that the farming business in the study area is heavily influenced by the frequent occurrence of drought and increased temperature. In addition, flooding was another climatic indicator that smallholder crop-producing farmers perceived changes in the past two decades. However, about 7.94% of the respondents perceived the frequency of flood as increased, 43.24% decreased, 38.8% unchanged and the remaining 10%of the respondents had not observed the flooding pattern in the past two decades. A change in climate could be a reason for the worse level of production, productivity and livelihood situations of the majority in the study area. This can possibly decrease the sectorial contribution of crop sub-sector nationally".
6	Contributions of non-timber forest products to people in mountain ecosystems and impacts of recent climate change	Gurung, L.J.; Miller, K.K.; Venn, S.; Bryan, B.A.	Ecosystems and People	2021	10.1080/26395916.2021.1957021	"The respondents perceived notable changes in the climate and in extreme events over last the 20– 30 years (Table 4). We asked whether 'Climate change is happening in your area' and 86% responded in the affirmative. Respondents reported an increase in maximum and minimum temperature, an increase in summer rainfall amount, an increase in winter drought, an increase in hailstorms, an increase in pest and insects, and an increase in invasive plant species over the last 20–30 years. Most people believe that summer temperatures have increased as had summer rainfall. Most people had also perceived an increase in winter drought, an increase in hailstorm and almost all had noticed an increase in forest pests and insects and invasive plants. Most respondents had observed a decrease in winter rainfall and almost all had perceived a decrease of snowfall (Table 4). Respondents identified an increase in hailstorms, an increase in pest and insect attack, expansion of invasive plant species, strong wind events, changes in rainfall and temperature patterns, increased slides and floods, and more frequent and severe winter drought as the major drivers reducing the availability of NTFPs".
6	Spatial Variability and Temporal Trends of Climate Change in Southwest Ethiopia: Association with Farmers' Perception and Their Adaptation Strategies	Habte, A.; Mamo, G.; Worku, W.; Ayalew, D.; Gayler, S.	Advances in Meteorology	2021	10.1155/2021/3863530	"The perception of farmers on climate change is presented in Table 4. The majority of the respondents in South Ari (94.11%) and Konso (95.0%) stated that they have the awareness of changes in the climate of their locality. In addition, there was no statistically significant ($P < 0.05$) difference between farmers in South Ari and Konso on their perception of climate change (Table 4). The Belg rainfall was considered in a declining front over the past three decades by 82 and 88% of the respondent farmers in South Ari and Konso, respectively (Table 4). However, 5.88 and 10.0% of the respondent farmers considered that the Belg rainfall increased for the same period. Similarly, the majority of the respondent farmers in South Ari (94.1%) and Konso (82.5%) considered that the Autumn rainfall decreased over the past thirty years. Regarding temperature, it was perceived as increased by 85.29 and 95% of the respondent farmers at South Ari and Konso, respectively (Table 4). The perceptions of farmers on changes in Belg and Autumn rainfall and temperature were not statistically different ($P < 0.05$) between the two locations. The impacts of climate change were well recognized by the respondent farmers in the region (Figure 6). The decline in crop productivity (86.49%), increased livestock disease (74.32%), increased human disease (60.81%), and increased drought frequency (52.7%) were the major threats of climate change identified by the participant farmers. In addition, increased crop pest (48.3), water shortage for human and livestock use (43.24%), and increased flood frequency (35.14) were other impacts of climate change perceived by the farmers with decreasing rank of severity. Similarly, farmers who participated in the focus group discussion explained their perception of climate change and the risks they faced as follows. The amount of rainfall we got during the crop growing period was decreased and our area becomes warmed as compared to the earlier period. Productivity of our crop and livestock was becoming lower and lower due to a shortage of water. Sometimes, we faced total failure of crop stand.Scarcity of water for human and livestock use imposed a higher burden on us for searching the water in distant places. Supporting the farmers' view on climate change and its impact, key informant interview participants also disclosed their observations as follows. The temperature and rainfall of our area have been changing. >e rainfall received during the crop growing period was decreased that influenced the yield of crops. Similarly, the temperature was increasing from time to time. Population size has been increasing and posed pressure on natural resources especially cultivating land. Deforestation is practiced by people to alleviate the shortage of cropland that aggravated the effects of changes on temperature and rainfall. Farmers in the midland and high land area are producing crops that were produced in the low land area previously due to the change in rainfall and temperature. In addition, diseases like malaria occurred more frequently in different areas as compared to earlier periods. So, farmers are facing challenges in relation to climate change."
6	Farmers' Perception on Climate Variability and its Effects in Ambassel District, Northern Ethiopia	Destaw, F.; Fenta, M.M.	Agricultural Research	2021	10.1007/s40003-021-00573-9	"The results indicated that about 95.9% of respondents perceived the change in local climate while 1.4% of households perceived the local climate was not changed in the last two decades. We found that a small portion of respondents (2.7%) didn't have any perception of whether the local climate was changed or not (Table 3). The result was true across each kebeles/agro-ecological zones that revealed a non-statistically significant difference. (...) Accordingly, 32.7% of the respondents perceived unpredictable rainfall as an indicator, followed by (27.9%) who responded increase in temperature as the major indicator of change in local climate. The rest (39.6%) complained recurrent droughts, a decrease in water availability, disease and flooding as indicators of climate change and variability in the study area (Fig. 2). (...) The majority of farmers perceived the increasing trend of temperature, many hot days and warm nights from time to time in their localities. Among those who perceived a change, about 94.9% of respondents had perceived that the temperature is increased over the past two decades. On the contrary, only 5.1% of respondents perceived as a decrease in temperature trend and none of the respondents perceived ''no change'' in temperature at all. Besides, farmers perceived an increase in hot days and warm nights in the study area (Table 4). (...) According to the information obtained from the focus group discussions (FGDs) and key informant interviews (KII), participants had observed an increase in temperature and irregular distribution of rainfall during the rainy season. They observed the shortening of the rainy seasons, delayed in rainfall events than they used to do in the past. Also, they observed that the rainfall amount, frequency and distributions had changed. The problem has become more severe since the last decades. Moreover, some of the participants from highland and midland AE claimed an increase in temperature had a positive effect to increase agro-biodiversity and productivity. For instance, maize has been introduced to those areas in recent years, which is favored by the increasing temperature. Similarly, the majority of the respondents (83.3%) complained that the annual rainfall amount has decreased and this was due to irregular distributions of rainfall, while a few respondents (5.8%) perceived increased in rainfall and other farmers (10.9%) felt that annual rainfall amount was the same as the previous one (Table 4). (...) Moreover, majority of farmers had the opinion to the change in timing of rainfall onset and cessation as becoming more unreliable in their localities. About 36.2% and 17.1% of the farmers perceived the late start and early end of the rainy season, respectively. Also, 90.5% of households perceived the late start of cropping period than normal. This means that they observed a decrease in the length of growing season over the study area. In addition to variability and change in climate parameters, its effects have been perceived by smallholder farmers in Ambassel District. The farmers complained that climate change and variability had caused a prolonged drought that had negative effects on livestock and crop production. This was emphasized by results from key informant interviews, focus group discussions and the household survey. The result showed that 98% of households responded that they were worried about the effects of climate change and variability. Only 2% of the respondents were not concerned about climate change-related risks".

6	What caused smallholders to change farming practices in the era of climate change? Empirical evidence from Sub-Himalayan West Bengal, India	Datta, P.; Behera, B.	GeoJournal	2021	10.1007/s10708-021-10450-1	"Only 11.25% of farmers knew the term ‘‘climate change’’ and heard it mainly from mass media (for instance, television and daily newspapers), and climate change was explained by less rainfall and temperature warming by them. However, they were not aware of its causes and consequences in detail. On the other hand, for capturing the perception of climate change by the rest of the farmers, a simple explanation of ‘‘climate change’’ was provided. They were told to explain their ideas on the changing temperature and precipitation over the last 30 years. A majority of them reported decreasing rainfall, decreased number of rainy days, delayed onset and withdrawal of monsoon, increased summer temperature, and lesser cold winter months (Fig. 5). (...) It means that the farmers of the sample villages have perceived the climatic changes extensively through their observations and successfully recalled them. During the survey, respondents revealed that they were highly dependent on rainfall, which eventually helped them perceive the changes easily. Around 10.42% of farmers indicated that the changes in the rainfall and temperature are accountable for deforestation. They narrated that ‘‘trees can attract clouds,’’ and because of less rain, the temperature is also getting warmer. The rest thought that changes in the climatic parameters are entirely natural, and they cannot control it. As per them, ‘‘how can we know what is happening over the sky?’’. Table 2 presents farmers’ perceptions regarding agricultural risks associated with climatic changes. Pest attacks were perceived as a major risk to agricultural production, and farmers stated that it was caused by decreased rainfall. In general, all the farmers noticed that the yields have decreased, specifically for paddy and potato, due to the increasing incidences of pests. Farmers observed that the ponds (a means of tank irrigation during the dry period) are drying up quickly in recent times. One farmer stated that ‘‘about 12–15 years ago, water used to stand up to February, but that gradually decreased to the month of November December.’’".
6	Climate change and hunter-gatherers in montane eastern DR Congo	Batumike, R.; Bulonvu, F.; Imani, G.; Akonkwa, D.; Gahigi, A.; Klein, J.A.; Marchant, R.; Cuni-Sanchez, A.	Climate and Development	2021	10.1080/17565529.2021.1930987	"Most Twa (>60% respondents) reported a reduction in the amount of rainfall and the length of the rainy season (late onset) while a few respondents also mentioned an increase in dry spells during the rainy season or increased showers during dry season (Figure 2). Most Twa also reported a reduction in fog (number of days with fog and quantity of fog), frost, strong winds and hail storms (Figure 2). About 50% of the Twa also reported warmer temperatures during the dry season (Figure 2). There were no significant differences between male and female respondents (paired T-test, $p > 0.05$), see Figure 2. (...) Overall, there were little differences on the climatic changes reported by Twa and Tembo (although we used different methods, household questionnaires vs FGDs, respectively). Tembo reported the same direction of change as Twa for amount of rainfall, dry spells, showers, temperatures, fog and hail storms, but opposite direction of change for length of the rainy season and wind (Table 2). It is possible that most Tembo mentioned increased length of the rainy season because of a perceived increase in showers during the dry season (Table 2). The percent of respondents who mentioned an increase in dry spells during the rainy season was also greater for the Tembo than for the Twa (>70% compared with <25% for the Twa, Table 2). It is likely that more Tembo reported these changes (compared with Twa) because for most Tembo farming is their main livelihood activity, and they have to pay particular attention to these changes due to the effects they have on crop yields and pests (dry spells cause crop failure and showers increase pest prevalence). (...) Most Twa (>70% respondents) reported a decrease in floods, stream flow, landslides and soil erosion (Figure 2). In terms of changes in the biological domain, most Twa (>70% respondents) mentioned a reduction in the abundance of caterpillars, honey, mushroom and crabs, a reduction in fruit yields of wild fruiting plants and that some tree and wild animal species had become rare (Figure 5). They also reported a decrease in yields of several crops (Figure 5). There were no differences between male and female respondents (Figure 5) except for two observations: only a few men reported a decrease in Marihuana yields and only a few females reported a decrease in wild yam abundance (activities restricted to males and females, respectively). (...) Remarkably, contrary to the Twa, most Tembo mentioned an increase in floods, stream flow, landslides and soil erosion, which is completely opposite to what most Twa reported (Figure 2, Table 1). These divergent perceptions can be explained by the fact that Tembo own land for farming (which may be damaged by floods, landslides and soil erosion), and that they live in larger villages. About 50% of the Twa respondents live in the same area where Tembo live (western part of Mt Kahuzi), so local topography such as slope or aspect is unlikely to explain these differences in direction of change. While Twa respondents did not have an explanation for the reported changes in the physical environment, most Tembo mentioned that these changes were related to deforestation in the area, with comments such as e.g. ‘Now there is less forest on top of hills, that is why there is more soil erosion and landslides’. (...) For the Twa the perceived causes of the observed reduction in NTFPs’ abundance were climatic, but that for wildlife it was overhunting (Table 3). Ancestors’ will – with comments such as ‘the ancestors have left with their treasures, as we are no longer taking care of the forest’ – were mentioned by a few participants. The perceived cause of all the observed changes in the biological domain for the Tembo was deforestation. Tembo respondents explained that: e.g. ‘before there were more patches of forest between farmers’ fields, the area was more humid and cooler and avocado trees produced more fruits’ and ‘before there were more forest patches with insects, which would eat the pests of cassava, now there are fewer forests and insects, and cassava is more sick’. Perceived changes in crop yields could also be related to nutrient depletion in the soils, related to shorter fallow rotations. Preliminary investigations show that fallow rotations have been significantly reduced in Tembo farms (ongoing research)".

10	Understanding climate change and drought perceptions, impact and responses in the rural Savannah, West Africa	Adaawen, S.	Atmosphere	2021	10.3390/atmos12050594	"Most farmers in the rural communities of the study area already had some general perceptions of changing climatic and environmental conditions, as well as some ideas formed from local radio programmes and agricultural extension officers. To ensure some clarity and distinction from general or local generic terminology to environmental change (korum la teeri—literally: the past/surrounding/environment has changed) (see also [57]), much explanation was done in asking farmers on their views and perceptions of how the climate has evolved over, at least, the past 30 years. As may be seen Table 1, for the majority of farmers who alluded to climatic changes in the surveys, the perceived changes basically manifested as irregular and less/no rainfall (drought). A few of the farmers also mentioned the high/warm temperatures being experienced in recent times as being caused by climatic changes. Whilst there seemed to be no distinction in regards to changing weather conditions and climate change, the widespread admission from both the interviews and surveys was that the rainfall pattern had changed (saa la teeri me). Farmers pointed to a shift in the onset of rain for the farming season (sigir) (see also Roncoli [42] (p. 418)). They explained that the 'normal' seasonal timeline, as experienced over the years, was that the rains started in early April (dawalega); with the planting of crops like the early millet and sorghum, already commencing in the beginning of May (siibedaa). But because of the erratic nature of rainfall activity in recent times, one could no longer be sure as to when to prepare plots or even sow for the season. From the listing of the different perspectives in Table 2, the views of the farmers suggest some changes in the rainfall pattern and temperature in the study area. Local farmers have memories of a 'good' and timely rainfall regime in the past that used to be favourable for their farming activities and wellbeing. The issues of less rainfall and drought do not only reflect general views on how environmental and climatic conditions have degenerated, but also the adverse impact on their farming activities and crop yields. These views on climate change and drought across the communities in the Bongo area are well captured in the following responses: "(. . .) the rainfall is very poor as compared to the past. In the past 8 years or more, we used to sow in March/April when the rains set in. But now in June and even July, when we used to have abundant rains, you sometimes don't have anything nowadays. You cannot sow crops in time to have good yield, how do you survive or take care of your family?" (Akane. Male Farmer, Age: 47 years, Gowrie-Kunkua). "(. . .) in the olden days, it (rain) always started in April. Now, it comes in June and will end in October. Normally, July is supposed to be the time for heavy rains. But we are already in July 15th but no rain! Even when it comes and you sow, the rains can stop for a long time and the crops will not grow well or even die. It can stop for more than a month. This will affect the crops because not all crops will be ready for harvesting. If it rains up until 15 October, then it is okay. But if it stops around 10 October, then it is 2 weeks short. The crops will not do well." (Aduko. Male Janitor/Famer, Age: 36 years, Gowrie-Kansingo). In expressing their frustrations about the erratic nature of rainfall and effects of drought on their livelihoods, some farmers drew attention to the issue of 'false starts' that could trick one into sowing early. However, the general consensus was that 'false starts' were familiar occurrences of rainfall activity in the onset of farming seasons. For the farming season of 2012 (also 2015 and 2019), for example, farm plots in the area were prepared awaiting the rains to commence with sowing as early as the beginning of May. Yet, adequate ('real') rains started falling, albeit scantily, in late June. The late onset of rains for farming seasons had culminated in a shift of the cropping calendar in the area. One of the farmers lamented that: "The rainfall pattern is unpredictable. Some years, the time you need the rain to come, it will not come. Then at the time all the crops have gone beyond the stage they need more rain, you will now see more rain coming. So the rain pattern here is just unpredictable. Sometimes we will sow late because of the rain. We depend on the rain to do everything. So when the rains delay like this year; we plant late. Around July/August we should have been harvesting but that is not the case because the rains started late. So the rains are changing and it is getting bad every year." (Abagre. Male-Pharmacist, Age: 52 years, Bongo-Nayire). There were other submissions to the effect that anytime there was a cloud formation to come down as rain, the weather suddenly became windy. As a result, the rain only drizzled for a while with little precipitation amounts. Across most rural communities in Northern Ghana, there is a penchant for some farmers to wait on others to commence with sowing before they also start sowing their seeds. Hence, there is often the tendency to start crop cultivation late across communities. Whilst this delay may be due to the limited numbers or lack of tractors or bullock ploughs to prepare the land in time, some also wait to be sure of the rains before they commence with sowing. Other farmers also delay as a strategy to not overly expose crops to birds and other pests. However, the behaviour or arrival of certain birds, like koobere (weaver bird), or flowering of certain trees (Acacia and Baobab) used as proxies to predict the nature and start of the wet rainy season have become increasingly unreliable. These proxies and other events are local weather or climatic elements that have become part of the 'schema' or cognitive landscapes of the people over the years.With farmers already conversant with similar occurrences, 'false starts' of rainfall have progressively become part of their mental models of climate change and drought (mostly 'agricultural drought') in the area. What has mostly been acknowledged is that the lack of precipitation and prolonged intra-seasonal dry spells have become frequent and severe in recent times. In the opinion of farmers, the long dry spells and high temperatures that come with the scorching sun often cause the crops to wither and die. They further explained that millet crops in particular normally appear to be growing well after sowing. But at the time the rain is expected to ensure good harvests, it is delayed or never comes. The rain sometimes stops abruptly during the season, although it might have started late. This often results in post-flowering water stress and impact on the yield of relatively climate-sensitive crops like millet and groundnuts. Moreover, the torrential and stormy nature of the downpours tend to destroy the late millet and guinea corn; especially during the flowering stage. The stalks of the millet crop normally bend or break off and fall to the ground due to the intensity of the wind associated with the storms. "When I was growing up as a young girl, the rainfall was accurate. There was a time when there was a time the rain stopped for a long time and resulted in severe hunger. We had to sometimes walk to Bolga to queue for wheat that was being distributed. Apart from that time, I was young . . . the rains used to start at the right time. You could actually tell or sense the onset of the rains with the arrival of koobere (weaver bird). Because the rains used to be timely, the crop yields were bountiful. I remember some time ago, my family fed on a season's harvest for 3 years. The rain at the time was good but now the rains don't even come. I don't know if the lands are infertile or not. But as for the rain it's very bad, it doesn't rain at the right time." (Mma. Female Farmer/Food Vendor, Age: 63 years, Bongo-Tingre)".
6	Factors affecting small-scale fishers adaptation toward the impacts of climate change: Reflections from south eastern Bangladeshi fishers	Alam, E.; Hridoy, A.-E.E.; Naim, M.	International Energy Journal	2021		not applicable
10	Responses of the Tharu to climate change-related hazards in the water sector: Indigenous perceptions, vulnerability and adaptations in the western Tarai of Nepal	Chaudhary B.R.; Acciaioli G.; Erskine W.; Chaudhary P.;	Climate and Development	2021	10.1080/17565529.2021.1889947	"The responses of participants regarding the perception of climate change were rated against seven indicators, as shown in Figure 2. Chi-square tests showed some highly significant ($p<.001$) positive responses of respondents to the indicators when combining responses from the two villages (Thapuwa and Bikri), but differences between villages in response to climate change indicators were non-significant, which indicates the consistency of perception over communities. All indicators except one (increased winter temperature) were consistent with the perceptions since three-quarters of the respondents have observed changes. (...) The perceptions of temperature change positively correlated with measures of climate trends in the region. Most participants indicated increased monsoon temperatures, which is in line with temperature data trends. There is less agreement in the perception of the winter temperature trend. Some respondents perceived warmer winters than in the past 10–20 years; however, there were more people (55%) who perceived either colder winters or no increase in winter temperature. (...) Respondents perceived that rainfall was delayed in the monsoon season, unpredictable and decreased in the total number of rainy days in both monsoon and winter. However, people felt the increase in the intensity of rainfall, particularly in the post-monsoon period (October–November) caused flooding. A delay in onset of the monsoon and unpredictable rainfall exert an impact particularly upon rice cultivation and irrigation planning in agriculture".

6	The importance of climate change awareness for the adaptive capacity of ethnic minority farmers in the mountainous areas of Thua Thien Hue province	Sen, L.T.H.; Bond, J.; Phuong, L.T.H.; Winkel, A.; Tran, U.C.; Le, N.V.	Local Environment	2021	10.1080/13549839.2021.1886064	"Ethnic farmers' awareness of climate change and adaptation is considered as four main determinants including conceptual awareness; experiential awareness; engagement awareness, and adaptation awareness (see Table 2). Table 2 presents the climate change awareness of ethnic minority communities in the upland areas of Thua Thien Hue province. A relatively low percentage of respondents strongly agreed or agreed with all statements used to measure four levels of climate change awareness, shown by the mode value of "1 – strongly disagree" in 8 out of 13 statements. For the first level of awareness, conceptual awareness, received relatively high scores, which vary from 2.01–3.58. The first two statements of conceptual awareness, the mode value of "1" indicated that a high number of respondents strongly disagreed with the statement of have heard a lot about climate change and understand well the causes of climate change. They explained that they haven't heard the words "climate change" and they, thus, did not clearly know its causes. However, many of them agreed that they understand well the effects of climatic changes and consider climate change as a serious risk from their own understanding and experience. Key informants also reflected that community information channels did not work properly. With discontinuous information flow and incomprehensive messages (through television, radio) due to language barrier and limited understanding capacity, farmers had to rely on the community social groups for information. Experiential awareness level received the highest scores from respondents. Almost all people scored above 3.0 for 3 out of 4 statements because they agreed or strongly agreed that all of their understanding about changes in climate extreme events and climate risks were drawn from their own local farming experience. Little was learnt from outside the community since they have few chances to travel and can't access much climate change information from other areas. Regarding the engagement and adaptation awareness, almost all statements under these two levels of awareness had very low scores. It showed that the majority of farmers disagreed with the statement that they had spent much time discussing or sharing with others regarding climate change impacts and adaptation. Farmers did not know much about climate change and relevant responses so they couldn't share or discuss with others in the community. Most farmers also revealed that the only way they learned to respond to climate change was to observe and apply successful adaptation measures of other farmers in the community. Other farmers stated that they did not have opportunities for discussion and could only exchange information immediately before or after the extreme event while working on farms. The community meetings or farmer group meetings did not incorporate these issues. Aligned with their customs, households successful in adapting to climate change were willing to share their experience with others and support their adoption. Survey results also found that these farmers were normally wealthier farmers with better education, better farming skills, broader social networks, and thus, they could access more information and were able to apply it on their farms".
6	Rainfall variability and socio-economic constraints on livestock production in the Ngorongoro Conservation Area, Tanzania	Leweri, C.M.; Msuha, M.J.; Treydte, A.C.	SN Applied Sciences	2021	10.1007/s42452-020-04111-0	"More than two-thirds (71%) of the respondents were aware of recent changes in rainfall patterns and increased frequency of droughts, floods, and disease outbreaks. They identified human land-use activities such as deforestation, desertification, and improper grazing practices as the main factors impacting rangelands. Majority (79%) of pastoralists claimed that the amount of rain per season has increased over the last ten years, but rainfall events had become more unpredictable and shorter in duration as summarized in Table 1. Most respondents (76%) also perceived an increase in drought frequencies. About two-thirds, i.e. 63%, and 73% of the 241 respondents, mentioned that they need more time for finding good grazing areas and that shrubland cover has increased over the last ten years, respectively. More than half (50%, 60%, and 62%) of the respondents mentioned a decrease in availability of grazing land, grass cover, and grass species diversity, respectively. Drought was mentioned as the likely cause of decrease in grazing land by 21% (p = 0.01), while the remaining factors such as increase in human and livestock population remained less important".
6	Livestock farmers' perception and adaptation to climate change: panel evidence from pastoral areas in China	Yang, S.; Yu, L.; Leng, G.; Qiu, H.	Climatic Change	2021	10.1007/s10584-021-02992-7	"The major types of reported weather shocks are drought for households in Inner Mongolia and Xinjiang, and snowstorms for households in Tibet. The short-run perspective was set equal to one if the farmers perceived the dominant weather hazards, and zero otherwise. The descriptive statistics of perception data in Table 1 show that, on average, more than half of farmers perceived an increase in temperatures (54.3%) and a decrease in precipitation (55.1%), whereas 15.5% and 22.1% of households observed a decrease in average temperature and an increase in rainfall. About 25.6% households noticed an occurrence of extreme weather events in the previous year".
6	Climate change perceptions, data, and adaptation in the Garhwal Himalayas of India	Platt, R.V.; Ogra, M.; Kisak, N.; Manral, U.; Badola, R.	Climate and Development	2021	10.1080/17565529.2020.1724069	"The greatest consensus among respondents relates to precipitation: 82% of respondents perceive that rainfall is increasing and 79% perceive that snowfall is decreasing (Figure 2). In terms of temperature, results are split with 53% perceiving an increase in summer temperature but only 34% perceiving an increase in average winter temperatures. The majority of respondents (51%) perceive no change in winter temperatures, and a large minority (43%) perceived no change in summer temperatures. (...) There is agreement between perceptions and climate data for average summer temperature and rainfall. In both cases, more than 50% of respondents perceive an increase, there is a positive Sen slope, and the M-K test is significant at the p<.05 level (Table 4). For winter temperature and snowfall, there is no clear agreement. While there is evidence of a monotonic increase in winter temperatures (positive Sen slope and significant M-K test), 51% of respondents perceived 'no change'. A significant minority (34%) did perceive an increase in winter temperatures. While there is no evidence of a monotonic change in snowfall (M-K test not significant), 79% of respondents perceive a decrease. There is, however, a decrease in snowfall at higher elevations in the early winter period (Figure 4a, b). Interestingly there is little relationship between the level of consensus about environmental change (% of respondents who give the modal response) and the statistical confidence (p value of the M-K test) (Table 4). For example, a large number of respondents (82%) perceive that rainfall is increasing, but statistically the confidence is moderate that rainfall is increasing (p <0.05 but not p<.01). In contrast, a smaller number of respondents (34%) believe that winter temperature is increasing, but statistically the confidence is high that winter temperature is increasing (p< 0.01). The averages of the three years leading up to the survey (2013-2015) were characterized by above average temperatures, above average rainfall rate, and close to average snowfall rate (Table 5)".
1	Climate change adaptation for managing non-timber forest products in the Nepalese Himalaya	Gurung, L.J.; Miller, K.K.; Venn, S.; Bryan, B.A.	Science of the Total Environment	2021	10.1016/j.scitotenv.2021.148853	"People perceived an increase in invasive plant species, insect and pest species outbreaks, and an increase in extreme weather events such as hailstorms and strong winds, as well as natural hazards such as landslides and floods, as being associated with recent increased temperatures and changes in precipitation patterns, and that these have all negatively impacted the availability of NTFPs for mountain communities over the last 20–30 years (Fig. 3). Most respondents (68%) perceived the probability of occurrence of invasive plant species and their impacts on NTFPs will likely occur in the future (Fig. 4), and nearly a half of the respondents (43.5%) agreed on the probability of occurrence of pests and insects and their impacts on NTFPs. However, the majority of the respondents were not sure about the probability of occurrence of deficit rainfall and water stress and its impacts on NTFPs (98.2%), occurrence of extreme rainfall and landslides and its impacts on NTFPs (95.7%), occurrence of prolonged drought and occurrence of forest fire and impacts on NTFPs (95.3%), occurrence of extreme rainfall and floods and impacts on NTFPs (95%), occurrence of erratic rainfall and its impacts on NTFPs (92.8%), occurrence of strong wind and extreme hailstorms and impacts on NTFPs (89.2%) and occurrence of extreme hailstorm and its impacts on NTFPs (88.8%)".
1	Social-Ecological Change on the Mongolian Steppe: Herder Perceptions of Causes, Impacts, and Adaptive Strategies	Reid-Shaw, I; Jargalsaihan, A; Reid, RS; Jamsranjav, C; Fernandez-Gimenez, ME	Human Ecology	2021	10.1007/s10745-021-00256-7	"Herders generally saw stronger climate changes for precipitation than for temperature from 1995 to 2015 in the three focal soums (Table 2). Across all soums, herders reported shorter and more spread-out rainfall events. In Undurshireet and Yeroo (not Sergelen), herders reported less but more intense rainfall. For all precipitation conditions, Sergelen herders reported milder change than either Undurshireet and Yeroo. Herders reported cooler springs in all soums, but especially Sergelen and Yeroo, where 90% of herders reported cooling. While 65% of Undurshireet herders reported warmer winter temperature trends over the last 20 years, 60% of Yeroo herders reported cooler temperatures. Herders generally reported moderately strong to strong changes in pastures and water level conditions over the last 20 years (Table 3). Over 70% of herders in each soum saw lower water levels in lakes. Herders in both Undurshireet and Yeroo reported lower water volumes in rivers, less pasture growth, earlier browning of pastures, more frequent dust storms, and greater amounts of sand movement. Sergelen herder responses diverged from these two soums, although Yeroo herders tended to give the most consistent responses (low standard error) for pasture conditions compared with Undurshireet and Sergelen (Table 3)".

7	Interactions between Climate Change and Infrastructure Projects in Changing Water Resources: An Ethnobiological Perspective from the Daasanach, Kenya	Junqueira, A.B.; Fernandez-Llamazares, A.; Torrents-Tico, M.; Haira, P.L.; Nasak, J.G.; Burgas, D.; Fraixedas, S.; Cabeza, M.; Reyes-Garcia, V.	Journal of Ethnobiology	2021	10.2993/0278-0771-41.3.331	"In total, the 45 Daasanach interviewees mentioned environmental changes 194 times (citations), which were grouped in 73 observations of change (Supplementary Table 1). Most observations of change (25; 34.2 % of the total) referred to changes in the biological system, followed by changes in the human (23; 31.5 %), climatic (13; 17.8 %), and physical systems (12; 16.4 %) (Table 1; Supplementary Table 1). Most changes in the climatic system referred to increases in the frequency, duration, and intensity of drought, to an overall lower and more variable precipitation, and to increases in temperature and wind strength (Supplementary Table 1). These changes, particularly drought, were frequently mentioned as major or indirect drivers of changes in other systems. For example, several respondents mentioned that "now there is less grass for the animals because the droughts are longer." Regarding the physical system, most of the reported changes referred to changes in water quality and dynamics of Lake Turkana and to changing soil conditions (Supplementary Table 1). Respondents reported, for example, that "now the water of the lake is more salty," or that "the lake floods do not happen as before." Soils were mentioned to have become drier and less fertile, owing to drought and to the increase in wind-induced erosion (Supplementary Table 1). Daasanach interviewees also mentioned several changes in the biological system, including changes in the abundance and species composition of freshwater animals and plants, the abundance and behavior of wild fauna, and the mortality, productivity, and phenology of terrestrial plants (Table 1; Supplementary Table 1). People said, for example, that "now there is less grass and less fish in the lake," that "drought and hunting have killed all the big animals," and that "there are fewer trees, [because] they are dying from drought and people are cutting them down." Changes in the human system were among the most frequently mentioned and largely focused on livestock and pastures (Table 1). The Daasanach agreed that there has been an increase in the amount of livestock (owing to population growth) which, together with the increased droughts, are reducing the availability and productivity of pastures. This overall reduced availability of pastures, they say, is leading to lower productivity of livestock and more livestock diseases. Changes in agriculture were less frequently reported and mostly related to the reduction of suitable cultivation areas along the Omo Delta and along small rivers (Supplementary Table 1). Most OC (64; 87.7%) were associated with "climatic" drivers, followed by "socio-demographic" (28.8%) and "infrastructure" drivers (26%), with 35% of the changes associated with more than one driver (Figure 2A). (...) A total of 17 OC (23.3%) referred to changes directly observed in hydrological processes (Table 1). Most of these (9 OC; 12.3%) reported changes in precipitation, namely the reduction in rain events during the dry season, changes in the temporal distribution and predictability of rains, the increase in intensity and frequency of droughts, and a prolonged dry season".
1	Knowing the Clouds through the Land: Perceptions of Changes in Climate through Agricultural Practices in Two Nahua Indigenous Communities	Martinez-Herrera, G.; Trejo, I.; Moreno-Calles, A.I.; de Alba-Navarro, M.F.; Martinez-Balleste, A.	Journal of Ethnobiology	2021	10.2993/0278-0771-41.3.849	"The analysis of the interviews indicates that farmers perceived changes in all climate indicators and biotic and agricultural variables (Figure 3). Rain was the most frequently cited indicator in both communities, followed by crop pests and wind. Overall, fewer people perceived these indicators in San Gabriel (SG) than in San Marcos (SM). Interviewees reported that rain has changed in three ways: rain intensity has decreased, the length of the rainy season has shortened, or both. Farmers who recognized changes in rain intensity mentioned that it used to be more intense in the past. These changes were usually expressed in terms of impacts on their daily life or material belongings, such as loss of houses, milpas, or work constraints. Other descriptions highlighted the impacts of rain on landscape elements, such as collapsed bridges or landslides (Table 2). Like rain intensity, people perceived that the rainy season has become shorter. However, the perception of this reduction is not the same because there is variation in the number of months that each person considers that the rainy season lasts (NSG = 6, 30%; NSM = 5, 25%). More people interviewed in the community located at a higher altitude (SG) perceived a reduction in the intensity of the rain, either by itself (N = 7, 58% of the farmers who reported changes) or combined with a shorter rainy season (N = 5, 42%). A small fraction of people living in SM mentioned changes in rain intensity alone (N = 3, 27%); most frequently, this was perceived in combination with a reduction in the length of the rainy season (N = 7, 63%). Only one person from SM perceived a shorter rainy season (9%). Changes in wind were the second most frequently mentioned climate change indicator. As with rain, farmers perceived changes in wind through the effect on their daily routines or material belongings, such as destroying houses or causing maize plants to topple over and abort maize kernels, thus recognizing it as a potentially dangerous meteorological phenomenon. Interestingly, the changes in the intensity of the wind are perceived not only by the damage it causes with maize but are also linked to other socioeconomic aspects that shape their perceptions. In one participant's opinion, the construction of new roads facilitated their access to the market to buy fertilizers that make maize more resistant to the attack of the wind (Table 2). Interview responses in both communities indicate a similar proportion of mentions (NSG = 12,60%; NSM = 7, 50%), and all responses indicated a reduction in wind intensity without persistent changes in its direction or seasonality. Although farmers recognized that wind is not as strong as before, they mentioned that it still poses a threat to their milpas which they cannot mitigate. Perceived changes in temperature were scarce and inconsistent (NSG = 5, 25%; NSM = 5, 36%). One participant reported that cold periods had become harsher or that the weather was now colder throughout the year, "as in December" (Table 2); however, the rest of interviewees did not mention changes in temperature, or they reported that the changes that they have perceived are not different from expected annual variation. Changes in production (NSG = 15, 75%; NSM = 9, 64%) and in maize quality (NSG = 12, 60%; NSM = 12, 85%) were the most mentioned non-abiotic variables. Two farmers mentioned that their production volume and the quality of maize has increased because now the climate is different than in the past (NSG = 1, 5%; NSM = 1, 7.4%). The rest explained that fertilizers and herbicides have improved maize's performance since they became available when roads were constructed approximately 15 years ago. The few changes perceived in biotic variables included shifts in plant phenology (NSG = 5, 25%; NSM = 6, 43%), sightings of uncommon animal species (NSG = 3, 15%; NSM = 6, 43%), and pests or plant diseases (NSG = 5, 25%; NSM = 8, 57%). Interviewees did not relate variation in flowering and ripening of fruits to the reduction in rain and wind intensity; instead, they explained them as part of the expected inter-annual variability or the outcome of bad management. Perceptions of change in animal behavior or sightings of uncommon species, such as coyotes, were thought to be a consequence of deforestation. Pests or plant diseases were associated with agricultural inputs (insects mixed in with fertilizers). Like shifts in rain and wind, farmers referred to changes in biotic variables through their consequences for their daily life and livelihood activities (e.g., crop loss due to pests or diseases). Ten interviewees (NSG = 4, 20%; NSM = 6, 43%) recalled years in which they observed atypical rainfall. Each of these years was mentioned by only one interviewee (except for 1975, which was cited twice), and according to farmers, in all of the years mentioned, rainfall was more abundant. However, although the years mentioned coincide with some of the strongest precipitation anomalies that occurred between 1954 to 2016, they do not coincide with the direction of the anomaly in all cases (Figure 3). There is a consensus among the farmers that rainfall has decreased over time; however, the analysis of the meteorological data shows a weak but non-significant increase in precipitation between 1954 and 2016 (Mann-Kendall $\tau = 0.008$, $p = 0.64$). Only three farmers (NSG = 1, 5%; NSM = 2, 15%) stated that the temperature was colder in 2002, 2013, 2014, and 2016, and only one farmer from SM (7 %) reported hotter temperatures in 2002 (Figure 4)".

1	Crop Diversity Management: Sereer Smallholders' Response to Climatic Variability in Senegal	Ruggieri, F.; Porcuna-Ferrer, A.; Gaudin, A.; Faye, N.F.; Reyes-Garcia, V.; Labeyrie, V.	Journal of Ethnobiology	2021	10.2993/0278-0771-41.3.389	"The first period includes the decades from the 1900s–1960s. During this period, the rainy season was long, lasting from May to November and, according to respondents, rainfall was "heavy and abundant," with high temperatures in the months preceding. After the rainy season, an intense cold settled from November to January, frequently accompanied by fog, which was important to cultivate long-cycle crop varieties by keeping humidity after the rain stopped. The forest cover at the time was dense and wild animals (e.g., hyenas, jackals, rabbits) were abundant. Most households at that time had cows and the herds were generally large. The intense drought starting in the early 1970s and lasting until 1976-1977 defines the second period observed by farmers, who refer to it by the Sereer word "ofein." According to the respondents, during the ofein years, rains occurred from July to early September, rather than during the typical rainy season (May to November in the years preceding the drought). Temperatures were warm all year and the cold weather typical of the end of the rainy season did not come. The lack of rain during crop flowering time in September and October resulted in poor harvests and famines. Moreover, households reduced the size of their herds, as grass was scarce. Some households started to practice transhumance, particularly before the rainy season (February to June). During the ofein, many trees, including fruit trees, died and wild animals disappeared because of drying and loss of forested habitat. The period that followed the drought, from the early 1980s to the late 1990s, was not described in detail during FGD. People mentioned that rain gradually increased during this time, particularly between June and September, making the rainy season shorter than before the drought. However, they noted that the rains came at different times of the year than in the 1960s period, with dry spells killing crops in several years. Farmers described cycles in which six good years were followed by a bad one. They also mentioned that temperatures ceased to be seasonal and that the cold temperatures at the end of the rainy season never came back after the end of the drought. The last period described by respondents started in 2000 and is ongoing. According to respondents, rainfall has resumed at a level equivalent to before the drought. The rainy season remains short, but the rain is abundant and evenly distributed over time. Farmers agree that, compared to the 1960s, temperatures are now warmer and there is more wind, which they relate to the lack of the natural barrier that trees provided. Farmers said they have adapted to the shorter rainy season by using animal-driven tools, such as seed drills, which enable them to cultivate larger areas faster, thus increasing the chances of a good harvest. According to farmers, the size of herds has not increased because all accessible pastureland is now under cultivation. Likewise, they said trees did not regenerate because the use of animal-driven tools, like seed drills and hoes, kills young shoots. (...) The climate variations reflected in the four periods led farmers to progressively change their agroecosystems in response to changes in crops and crop diversity. From farmers' narratives, it was evident that changes associated with rainfall, wind, and temperature were interconnected, but also connected to other environmental and social changes. For example, farmers stated that dry spells killed the seedlings before they could grow and that they needed to cultivate larger plots to have the same yields that they had before the 1970s drought. In the last and current period, farmers reported changes in crop varieties due to the combination of climate and other drivers (Figure 2). In particular, rainfall increase made possible the reintroduction of long-cycle varieties that produce greater biomass, which helped compensate for the decrease in other natural resources, such as fodder, wood, and fibers, provoked by a combination of climate variations and changes in cultivation practices. As the rainy season is now short, farmers combine long-cycle varieties with the short-cycle ones introduced during the drought period of the 1970s (Figure 2). The reintroduction of long-cycle varieties was also driven by population increase, which exerted pressure on land availability, drastically reducing pasture areas and accessible fodder. As a result of this pressure, fodder has now been replaced by stems of pearl millet and leaves of cowpea and groundnut".
1	Climate Change and Its Impacts on Farmer's Livelihood in Different Physiographic Regions of the Trans-Boundary Koshi River Basin, Central Himalayas	Paudel, B.; Wang, Z.F.; Zhang, Y.L.; Rai, M.K.; Paul, P.K.	International Journal of Environmental Research and Public Health	2021	10.3390/ijerph18137142	"This information on the respondent's noted indicators of climate change for the four physiographic regions of the basin have been summarized in Table 2. The farmers identified six main indicators of climate change in their local regions. The specific indicators did vary according to the physiographic region. The changes of temperature and precipitation were especially recognized as indicators of climate change by farmers in the trans-boundary KRB with 90.9% and 90.5%, respectively. Farmers shared during KII and FGDs, and the majority of the respondents in all regions of the basin strongly perceived that temperature and precipitation were strong indicators of climate change. Furthermore, the increasing trend of temperature and the decreasing trend of precipitation perceived by the farmers were supported by the station-based climatic records between 1980 and 2018 in all regions. Furthermore, of the farmers surveyed, around 83.3% perceived that the increase in climate-induced diseases and pests was another strong indicator of climate change, whilst 66.3% perceived an increasing trend for drought to occur as a result of climate change. About 97.9% of farmers in the Tarai region remarked that the increase in climate-induced diseases and pests was one of the indictors of climate change, and this was also the perception for almost 61.1% of farmers in the Gangetic plain (Figure 6). Drought was highly perceived as an indicator of climate change for respondents in the Tarai region and hill regions of the basin (83.5% and 80.2%, respectively), but this was less so for the farmers in the mountain region (Table 2). Farmers shared that during KII and FGDs, the drought seriously impacted their overall agricultural activities and crop production in recent decades. The farmers also indicated that the changes in crop yield and flood frequency were also indicators of climate change. For instance, flood events, as indicators of climate change, were perceived mainly by the respondents' of the Gangetic plain and the Tarai regions (72.8% and 46.9%, respectively), but much less so by farmers in the mountain and hill regions of the basin (Table 2). We noted that during KII and FGDs in the Gangetic plain, the livelihood of the farmers, especially in the monsoon season, was largely impacted by flood events in each year. The respondents of the study perceived that their livelihoods were impacted by climate change. They especially pointed out the impact noticed on major staple crops, vegetation, human health, livestock, and impact of natural disasters (particularly in flood events in the Gangetic plain and the Tarai regions and hailstorms in most regions) (Table 3). The five sectors listed in Table 3 reflect the strongly perceived impacts of climate change in the basin. Furthermore, the impacts of climate on the different physiographic regions of the basin varied, for example, the farmers of the Tarai region and the Gangetic plain were mainly impacted by natural disasters, especially from floods; of course floods had less of a direct impact on the mountain and hill regions of the basin (Figure 7). The farmers of the basin mostly felt the adverse impacts of climate change on yields of staple crops and human health (89.4% and 82.5%, respectively). Furthermore, during the KII and FGDs, the farmers also pointed out that they perceived impacts from climate change on their staple crops, on human health, on their livestock, and also from climate-induced disasters. Full details of the farmers' perceived impacts in various sectors for the different physiographic regions of the basin are summarized in Table 3".
1	Perception of agricultural drought resilience in South Africa: A case of smallholder livestock farmers	Bahta, Y.T.	Jamba-Journal of Disaster Risk	2021	10.4102/jamba.v13i1.984	"Almost two-thirds (64.25%) of respondents perceived that their farming operations were very highly vulnerable to agricultural drought, 16.43% highly vulnerable and 13.53% moderately vulnerable. Finally, yet importantly, 1.93% and 3.86% of respondents perceived themselves as having zero and low vulnerability to agricultural drought, respectively. Amir Faisal, Polthanee and Promkhambut (2014) highlighted that farmers are aware of the intensity and the nature of recurrent drought. The experience and the severity of drought ranged from 2 to 5 years on respondents' farms. The most severe years of drought which respondents prioritised were 2015–2016, 2016–2017; 1982–1983, 1992–1993, 2009–2010 and 2012–2013".

1	Perceptions and vulnerability of farming households to climate change in three agro-ecological zones of Ghana	Owusu, V.; Ma, W.L.; Emuah, D.; Renwick, A.	Journal of Cleaner Production	2021	10.1016/j.jclepro.2021.126154	"Table 3 presents the distributions of farming household heads' perceptions of climate change in the agro-ecological zones. It shows that the mean perception scores for the farming households in the Forest-Savannah Transition zone regarding temperature variability and rainfall variations were relatively higher than those in the Guinea Savannah agro-ecological zone. The farming households in the Moist Semi-Deciduous Forest zone, however, had relatively lower perception scores on temperature variations. (...) The mean perception score on increased rainfall intensity was even negative for the farming households in the Guinea Savannah zone. (...) In terms of extreme climatic events, the Guinea Savannah agroecological zone recorded higher mean perception scores regarding the increased incidence of prolonged drought and frequency of bush fires. (...) The negative mean perception scores for the farming households on the increased incidence of floods for all the three agro-ecological zones reveal their objection to the claim of the prevalence of floods in the agro-ecological zones. The overall perception indices for the farming households on climate variability in the agro-ecological zones were positive. The Guinea Savanah agro-ecological zone recorded the highest overall perception index on climate change and variability. (...) Notably, we find that the mean perception scores for the farming households in the Forest-Savannah Transition agro-ecological zone on food production and security were positive and relatively higher than the other zones. They objected to the perceptions of reduced crop yields, and household food availability in the agro-ecological zone. (...) The Moist Semi-Deciduous and the Forest-Savannah Transition zones recorded negative mean perception scores for increased expenditure on health. The Guinea Savannah and the Moist Semi-Deciduous Forest agro-ecological zones recorded negative mean perception scores for water shortages, indicating their non-objection to the statements on the impact of climate change on water shortages in the two zones. On the impact of climate change on livelihood diversification strategies, the Guinea Savannah and the Forest-Savannah Transition recorded negative perception scores for reduced off-farm income, but positive mean perception scores for low livestock productivity. Farming households tend to resort to non-farm employment as a source of alternative livelihood option in leaner climatic seasons. (...) The overall perception index suggests that the impacts of climate change have been felt less by the farming households in the Moist Semi-Deciduous Forest than the farming households in the other two agro-ecological zones. Table 4 shows the results estimated from the non-parametric Mann-Whitney U-tests. These results are of particular interest to policy in that knowing that statistical differences exist between the perceptions of farming households in the different locations are relevant in guiding policymakers on what specific climate-related policy instruments could be implemented to assist the farming households in their climate change adaptation strategies. The results revealed statistical differences between the perceptions of the farming households in the Guinea Savannah and the Moist Semi- Deciduous Forest agro-ecological zones on all the perception statements capturing temperature variability, rainfall variations, climate extreme events, and climate-related impacts (see Table 4). We observe statistical differences between the perceptions of the farming households in the Guinea Savannah and the Forest Savannah agro-ecological zones on all the perception statements capturing extreme climate events and climate change impacts on food production and food security. However, no statistical differences existed between the farming households in the two agroecological zones on their perceptions on increased temperature for the past five years, unpredicted rainfall day,water shortages and reduced off-farm income.We also find that the farming households in the Forest-Savannah Transition and the Moist Semi-Deciduous Forest agro-ecological zones were statistically different in their perceptions on rainfall variations, access to health and water, and livelihood diversification strategies. The farming households in the two zones were, however statistically similar in their perceptions on the increased temperature in the last five years, increased frequency in bushfires, and reduction in household food availability. (...) We also find that the strongly agreeing perceptions of the farming households on temperature variability were significantly influenced by farm and institutional characteristics. The study also revealed that the most significant factors that influenced the strongly agreeing perceptions of the farming households on rainfall variations were age, gender, education, farm characteristics, farming experience, access to credit and extension. The marginal effect of 0.15 for the gender variable in the unpredicted rainfall days specification indicates that the strongly agreeing perception of the farming households decreases by 15% for men compared to women household heads. Also, the strongly agreeing perceptions of the farming households tend to increase by 0.8% when the number of years of schooling increases by 1 unit. The strongly agreeing perceptions of the farming households on climate extreme events were influenced by education, farm distance, access to credit and membership of farmer-based organizations. Their strongly agreeing perceptions on food and household food security were significantly influenced by gender, education, household size, farm size, access to credit and membership of farmer-based organizations.We also find that the strongly agreeing perceptions of the farming households on access to water and health were influenced significantly by their education, farm characteristics, access to credit and membership of farmer-based organizations. Also the factors that significantly influenced the strongly agreeing perceptions of the farming households on livelihood diversification were education, household size, farming experience and extension".
1	Climate change impacts on glacier-fed and non-glacier-fed ecosystems of the Indian Himalayan Region: people's perception and adaptive strategies	Kuniyal, J.C.; Kanwar, N.; Bhoj, A.S.; Rautela, K.S.; Joshi, P.; Kumar, K.; Sofi, M.S.; Bhat, S.U.; Rashid, I.; Lodhi, M.S.; Devi, C.A.; Singh, H.B.	Current Science	2021	10.18520/cs/v120/i5/888-899	"The study explains that most of the respondents (91%) have experienced significant changes ($P < 0.05$) in the glacier-fed basins, particularly in case of Sindh, Parbati glacier-fed basins and Ranganadi non-glacier-fed basin (Annexure 1). However, in view of changing climate; no such consistency ($P > 0.05$) by 86% respondents was found in other two basins (Dhauliganga glacier-fed and Imphal basin non-glacier-fed). The interviewees were of the view that glaciers in their respective regions are melting fast due to climate change. (...) In the Sindh Basin, 89% respondents perceived increase in summer temperature, while 79% of the total respondents perceived increase in winter temperature. (...) In the Parbati Basin, 94– 97% of the total respondents perceived significant ($P < 0.05$) changes in precipitation (snowfall and rainfall) amount and pattern, whereas 91% and 71% of the total interviewees perceived an increase in summer and winter temperature respectively. (...) About 91% of the total respondents showed significant difference ($P < 0.05$) in the Dhauliganga Basin; they had observed a change in summer temperature along with increasing trend in winter temperature. (...) Climatic parameters also indicate changing climatic conditions as perceived by people in the IHR. Besides, about 61% of the total respondents showed significant difference ($P < 0.05$) in response to alteration in water bodies and 95% of the total respondents noticed a change in land-use pattern in the Dhauliganga Basin. (...) The chi-square test also showed significant ($P < 0.05$) differences in different responses obtained from the respondents. These are mainly cropping pattern (87%) and land-use pattern (80%). Major drivers of climate change were traced in terms of temperature, rainfall and snowfall, and infestation of pests and diseases (Annexure 1). (...) The local people from villages at different altitudes in both the regions mentioned that low rainfall or shift in rainfall pattern had resulted in crop failure, declining yield of food grains and fodder (Table 2), less traditional, horticultural crops cultivation and animal husbandry, but more modern cash crops. The traditional crops will soon be replaced with cash crops like vegetables, peas and potato in higher altitudes (Table 3). It was also reported by the respondents that use of chemicals has resulted in decrease in soil moisture which will be affected by its changing amount, pattern and precipitation cycle. Respondents from Parbati and Dhauliganga glacier-fed basins as well as Ranganandi and Imphal non-glacier-fed basins raised the issue of relatively less scientifically planned road construction in a fragile mountain ecosystem".

1	Differences in local perceptions about climate and environmental changes among residents in a small community in Eastern Siberia	Takakura, H.; Fujioka, Y.; Ignatyeva, V.; Tanaka, T.; Vinokurova, N.; Grigorev, S.; Boyakova, S.	Polar Science	2021	10.1016/j.polar.2020.100556	"The results for the mean score of each question item about the climate changes in the village are shown in Fig. 3. (...) All of the results from the question items regarding atmospheric warming had high scores. The scores of "annual mean temperature increased (QI1.1)" and "temperature increased in the winter (QI1.2)" were especially high, with a mean value of 3.91 and 3.98, respectively. Some of the mean scores of question answers about precipitation—" rainfall amount increased (QI2.1)," "the number of rainy days increased (QI2.4)," "the intensity of rainfall increased (QI2.5)," and "the occurrences of untimely rainfall increased (QI2.6)" were also high with values of 3.63, 3.39, 3.38, and 3.42, respectively. An item about the tendency of less rainfall, "drought occurrence frequency increased (QI2.7)," also recorded a high median value of 3.20, thus implying that opposite perceptions about the increase/decrease of rainfall were present among the residents of the same village. Conversely, the mean score of "the cessation of rainfall became more unpredictable (QI2.3)" was relatively low with mean values of 2.73. All scores for each question about snowfall were less than the median value, which showed the negative perceptions of respondents. In particular, the score of items "number of snow days increased (QI3.4)" and "the intensity of snowfall increased (QI3.5)" were relatively low with values of 2.18 and 2.31, respectively. The other three questions regarding climate changes, namely, "the frequency of strong winds increased (QI4.1)," "strong glaze ice increased (QI4.2)," and "frost increased (QI4.3)," there were no specific features around the median degree, with values of 2.96, 3.02, and 3.07, respectively. (...) According to the interview survey, oral narratives of the local people showed that the village has experienced several droughts in their lifetimes. One female informant, who was born in Khayakhsyt village in 1947, told us there used to be a drought every 10 years, and the last occurred in 1988. Recently, she has felt it is much rainier. Many others also remembered the regional droughts. There is a large lake near Churapcha village, but it was artificially built during the time of socialism. After the 1960s' state farm rural development, Churapcha village was also rebuilt as a state-sponsored centralized settlement for the relocation of the local populations who had resided as separate families in surrounding alaas. Due to this increase in the village population, water shortage issues became seriously apparent, and the local government decided to develop the artificial lake. According to a male informant, who was born in 1961 and now lives in Churapcha, despite this policy there has been a severe drought every 20 years in this region, and the local government had implemented 42 artificial lakes during the Soviet time. Thus, one feature of the local climate is drought. These narrative results was supported by the physical data of annual rainfall fluctuation shown in Fig. 2. According to the ethnographic survey, the river and lake ice are very important for the traditional livelihood and daily lives of Sakha people (Takakura, 2018). The interview results who that even in contemporary rural conditions, the local Sakha people usually obtain a huge amount of lake or river ice in the vicinity of the village during late October and early November for the coming year's consumption. When the temperature would be around 20 ◦C, they keep ice blocks in the underground storage in their residences and use throughout the year. Taking this ethnographic information into consideration, the local people might have faced severe water shortages in several years. Furthermore, if we consider that winter precipitation usually contributes to the volume of spring-thawed regional water, the low degree of winter rainfall signifies only small water resources for local communities between spring and early summer.village was also rebuilt as a state-sponsored centralized settlement for the relocation of the local populations who had resided as separate families in surrounding alaas. 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3	Determinants of climate change adaptation and perceptions among small-scale farmers of Embu County, Eastern Kenya	Kangai, R.; Chitechi, E. W.; Koske, J.; Waswa, B.; Ngare, I.	African Journal of Environmental Science and Technolog	2021	10.5897/AJEST2020.2943	"The farmers identified climate change indicators as crop failure, the decline in crop yields, the disappearance of crop variety, outbreak of crop pest and diseases, the outbreak of livestock pest and diseases, insufficient and poor quality pasture, low milk and meat production, and death of livestock as the major constraints to farm incomes. The majority (96%) of these farmers indicated that they had observed unreliable seasonal rainfall amount, distribution, and increased temperatures. For instance, 23% interviewed were aware of the long-term change in temperature while 55% were aware of a change in the amount of rainfall per season. There were frequencies of prolonged dry spells and a general delay in on-set of rains and abrupt end of the seasons (table 2). (...) Increased drought incidences were a common view in the study area for both the individual farmers and focus groups. Furthermore, focus group discussions identified 1979-1980, 1983-1984, 1999-2001, 2004-2005, and 2013-2014 recording worst memories of extreme temperatures. The respondents were concerned about the high variability and seasonal changes that stalled their ability to predict and plan farming activities on time."
3	Smallholder Farmers' Perception and Adaptation to Climate Change in Kurmuk District, Ethiopia.	Ayansa, A. D.; Bedemo, A.; Jara, G. O.	Applied Economics and Finance	2021	10.11114/aef.v8i5.5362	"Out 160 households about 64% of households perceived climate change and have adopted various climate change adaption strategies". About 60% of households access to credit service are perceive the climate change, while about 90% of households who have access to climate change had perceived the climate changes and variability. About 83% of households whose have an access to extension service had perceive climate change. From 160 sampled households about 69% of households were perceived climate change and variability. The result of the study showed about 87% of household perceive climate variability through decrease in rain fall distribution, while, 95% perceive increase in temperature from year to year. The result of the study showed about 22% of believed that the cause of climate change and variability was human action on natural resources, about 8% believed that natural process, about 26% believed both of both human action and natural process. The result showed that respondent households on consequences of climate change. Among these, 65% of the respondents respond that reduced crop yield, 60% weeds and pests, 58% outbreak disease, 56% food shortage, 55% reduced water quality and size, 54% frequent crop disease and 54% respond livestock death observed due to climate change."
3	Perception of impacts of climate variability on pastoralists and their adaptation/coping strategies in fentale district of Oromia region, Ethiopia	Mekuyie, M.; Mulu, D.	Environmental Systems Research	2021	10.1186/s40068-020-00212-2	"Ninety-eight percent of the respondents perceived that the rainfall has declined; rainfall comes early/late and ceases short from the normal rainy season, while 95% of the households clarified that the temperature has increased. Moreover, the findings indicated that there have been frequent droughts in the study areas as explained by 100% of the sampled households. As perceived by local respondents, the rising temperature, frequent drought occurrence and decreased Belg rainfall was in agreement with the findings of the observed data analysis. Notwithstanding, the Kiremt and long-term annual rainfall was not in accordance with their perception. In this study, the Belg rainfall occurs from March–April and the Kiremt rainfall occurs from July–September.(...) The majority of the respondents (90%) responded that the recurrent and prolonged droughts decreased number of livestock and productivity. (...) Results from FGD and KII indicated that climate variability and change affected the productive and reproductive performances of livestock and consequently their population growth through its effects on the quantity and quality of pastures and water availability in addition to increasing heat stresses.(...) The majority of the respondents (92%) complained that since the magnitude of drought has increased, the rangeland has been degraded and the palatable forages have recently been replaced by non-palatable plants. Respondents noted that before the grazing area recovered from the previous drought, another drought affected the new growth. This situation could cause loss of palatable forage species from the rangeland and reduces forage availability. Key informants also complained that as the dry season grazing areas deteriorated due to frequent droughts and unreliable and erratic rains, pastoralists concentrate their livestock around water points such as along the sides of perennial rivers, which in turn led to overgrazing of the existing forage resources. Consequently, overgrazing leads to expansion of low forage valued plants or unpalatable species around water points."
3	Perceptions and adaptation strategies to changing climate: evidence from farmers of northern dry zone of Karnataka.	Dupdal, R.; Patil, B. L.; Naik, B. S.	Indian Journal of Extension Education	2021	10.48165/IJEE.2021.57315	"The study on farmers' perceptions about changing climate revealed that seventy five percent farmers perceived climatic variability in terms of various meteorological indicators. About 70% farmers perceived decreasing quantity of rainfall and its unpredictable behaviour with prolonged dry spells during cropping season (Figure 1).(...) Farmers perceived significantly increasing temperature since past one to two decades and experienced frequent failure of monsoon while portion of farmers experienced water stress and water shortage persisted specially during summer season. Farmers in the region also opined that rainfall pattern was more uneven and unpredictable in the region than before. Further, delayed onset of monsoon and increasing occurrence of heat waves was also perceived by farmers. (...) The data on perceived impact of climate change on agriculture in the region revealed that eighty one percent of farmers reported that climate variability has adversely affected their farming in one or the other way (Figure 2). Perceived impact on changing climate were decline in crop yield, failure of crop due to delayed and unpredictable monsoon, declining water level in bore wells and open wells. Few farmers also experienced increased and emergence of new pest and disease and decline in fodder availability and consequently milk productivity."

3	Climate Change Adaptation in Akropong, Ghana: Experiences of Female Smallholder Farmers.	Addaney, M.; Sarpong, G. E.; Akudugu, J. A.	Journal of Land and Rural Studies	2021	10.1177/2321024921100 8537	"The study shows that most farmers in Akropong perceived changes in the rainfall pattern and increasing trend of warming/temperature in the area over time (see Table 4). The farmers particularly identified changes occurring in temperature and rainfall patterns over the years. The farmers were able to describe the changes they have observed over the years. They perceive the changes in temperature and rainfall patterns as a deteriorating phenomenon.(...) The farmers attributed the cause of changes in temperature and rainfall to many factors, including drought, deforestation, high intensity of sun and bush burning (see Table 5). The farmers explained that these elements cause high temperatures and rainfall variability. (...) Other factor identified by the farmers as cause of climate variability is the increasing influence of the dry Harmattan winds from the Saharan Desert that come through the northern part of Ghana to the transition belt where Akropong is located. These winds make the place drier and cause a rise in temperature. All the respondents further indicated that climatic event such as rainfall variability and dry seasons have major impacts on their farming activities.(...) The observations of local farmers on daily and annual climatic events translate into a valuable local knowledge system that is utilised by these farmers in making important decision regarding their agricultural activities. For the women farmers, climate variability is evident and they have better understanding of the phenomenon, which can influence adaptation practices. (...) The interview findings showed that the farmers argued that the drought, the Harmattan winds and the resultant high temperature and decreased rainfall patterns negatively affect crop yield and farming activities in the area. The farmers described times of favourable rainfall as good season and vice versa."
6	Climate Risks, Farmers Perception and Adaptation Strategies to Climate Variability in Afghanistan	Sarwary, M.; Samiappan, S.; Saravanakumar, V.; Arivelarasan, T.; Manivasagam, V.S.	Emirates Journal of Food and Agriculture	2021	10.9755/ejfa.2021.v33.i12.2797	"The farmers were interviewed in their local languages (Pashto and Dari), a number of response options were given to farmers as open-ended questions, and their perceptions towards the climate change impacts are presented in (Fig. 4). The major impacts of climate change are drying of water sources (80 %) followed by famine (71 %), crop failure (67 %), increase in food price (38 %), poor health of human leads to malnutrition (37 %) and poor health of livestock (18 %). Besides these impacts, loss of livestock and decline in livestock prices due to drought were also perceived by the farmers.(...) The results revealed that more than 80 % of the respondents were perceived the level of "high to very high impact" on loss of employment, labor scarcity, reduction on household income, pest and disease outbreak, and poor germination of crops as the result of climate change. (...) More than 75 % of respondents reported "high to very high" levels of impact on groundwater depletion, forest degradation, and pasture degradation. Further, it was observed that about 64 % of the respondents reported "high to very high" levels of impact on rainfall and about 56 % reported high to a very high" level of impact on surface water bodies. Interestingly, only 20 % of the respondents reported a "high to a very high" level of impact on temperature as a result of climate change. Thus, most of the sample respondents have strong perception on climate change affects the farming environment."
10	Are smallholder farmers' perceptions of climate variability supported by climatological evidence? Case study of a semi-arid region in South Africa	Rapholo, M.T.; Diko, Makia L.	International Journal of Climate Change Strategies and Management	2020	10.1108/IJCCSM-01-2020-0007	"A summary of farmers' perceptions of climate variability is presented in Figure 2. Majority of the farmers (76%) interviewed indicated that there was a decrease in the amount of rainfall, while 6% instead observed an increase. About 12% reported no change in rainfall, while another 6% were unsure. Most farmers (70%) felt there was an increase in temperature while 24% reported a decrease. Farmers' responses on temperature variability were consistent with perceptions of dry spells, with 65% reporting an increase in dry spells. A decrease in frequency of dry spells was reported by 17%, whereas 7% felt there was no change while 11% was not sure. With regard to the number of rainy days, 64% reported a decrease, while 20%felt there was an increase. Just over 12%were unsure of any change in number of rainy days while only 4% reported no change. Most of the farmers (97%) reported that the onset of the rainy season had shifted from around October to end of November and early December. Based on the participants' responses, about 64% correctly perceived climate variability whereas 36%perceived wrongly. During the FGDs, the farmers revealed that the rainy season ended as early as the beginning of March unlike in the past when rainy seasons ended at the beginning of April. One farmer in his late sixties indicated that during his teens, effective rains used to start early in the month of October, but nowadays, the rainy season starts at the end of November or even in December. There was a consensus on the fact that climatic conditions had become more erratic over the past five years. The farmers reported that there has been a change in the start and end of the rainy season, over past five years. The farmers raised concerns about the effects of the unpredictability weather patterns on their agricultural activities. Some farmers noted that over a decade ago rainfall distribution over the season was normal (implying enough and predictable) and they could plan their agricultural activities appropriately and effectively. Applying similar patterns of planning have proved abortive and fruitless, often resulting in financial loss. Another concern emanating from FGDs was regarding the spatial distribution of rainfall in the area. Farmers alluded to experiencing uneven distribution of rainfall, with some settlements receiving rainfall, while the neighbouring villages or communities were experiencing no indication of rainfall during the same time frame".

2	Climate change and variability discourse among community members and smallholder farmers in Mutoko District, Zimbabwe	Mugambiwa, S.S.; Rukema, J.R.	Mankind Quarterly	2020	10.46469/MQ.2020.61.2.5	"The study revealed that community members perceive numerous changes that have occurred over time. The changes hinted at include temperature shifts, unpredictable rainfall, and early drying of rivers. These are important observations inasmuch as they demonstrate that the community is aware of climate change and variability. Change in temperature was mentioned by many participants. The temperatures are reported to have shifted remarkably over the years, most notably the occurrence of hot days which are said to be extending into the winter and perpetuating throughout summer. One of the participants indicated the following: …there are a lot of changes that we are currently noticing for example in the old days the temperatures were not as hot as they are currently. Summer is hotter than it used to be and in the event that we have fewer rains as is common these days, our crops often suffer. [Jacob: In-depth interview July 2019]. The participants noted a relationship between higher temperatures and the less rainfall they now experience. These aspects together translated into serious concern for smallholder farmers because a combination of the two would mean that agricultural productivity is at risk. Another participant concurred that there are now more hot days compared to previous years. This is what he had to say: …we are overwhelmed by the changes in temperatures because there is a huge difference if I may say. Sometimes I wonder if we are going to survive in this heat because we are farmers here and we depend on farming for our survival so if the temperatures are hot and rains are not sufficient how will we make it? I even wonder if it is a sign that the ancestors have turned their back on us. [Richard: In-depth interview July 2019]. Despite the fact that the participant presumed that the changes were a result of the wrath of the ancestors, the major concern was the future of the community considering the fact that the temperatures are high and farm production is at risk. The emphasis on whether they would survive demonstrated that the community is aware of the extent to which climate change affects their survival. Also, it is this understanding that helps community members in crafting sustainable adaptation strategies. Another smallholder farmer who concurred with Richard brought in the fact that the effects of climate change are likely to be enormous since already the district is in the semi-arid region. Here is what the participant had to say: …the hot conditions we face now are actually a new phenomenon. This is however despite the fact that Mutoko has always been a hot area but the level of heat in summer is intensifying. [Tilda: In-depth interview July 2019] This participant indicates that change in temperatures is a serious issue that is affecting smallholder farmers in Mutoko district. (...) Other challenges reported in this study include lack of sufficient rains. As highlighted by one of the participants, a combination of lack of sufficient rains and hot temperatures is detrimental for smallholder farmers and the community as a whole because their livelihoods depend on sustainable agriculture. (...) A plethora of participants indicated that rainfall is no longer as predictable as it used to be before. (...) Given the nature of rainfall unpredictability, many farmers face numerous losses because at times rains come months after they have sowed their seed and in other instances the rains go when their crops are still in need of watering. To elaborate on the effect on sustainability, this is what some participants had to say: …there is a change in weather conditions and this change is what we have noticed over the years and we actually got used to it. If I remember very well for many years now the trend is like some years we get enough rains and some we don't. However, compared to now I can say some years back when we were young we used to receive more sufficient rain than we currently receive. Our plants and crops were fully fed and we never experienced many of the challenges that we currently face. Now even if the seasons alternate it is just an alternation of low rainfall which has severe negative effects on our work as farmers. [Tilda: In-depth interview July 2019]. Another participant indicated: …there is a huge difference in the patterns of rainfall between now and the time we were young. Now the rains we receive are not enough to sustain the crops and domestic animals we keep. [Richard: In-depth interview July 2019]. Another participant had this to say: …long ago we used to know that by October we would begin to receive rains but now the seasons have significantly shifted such that in some instances we receive first rains in January or February. So it is now difficult to understand which month exactly should we begin to receive the rains such that we are now unaware of which period exactly should we begin to plant our crops because at times we might receive rains very early and plant our crops but the rains would eventually disappear for a month or two. [Richmond: In-depth interview July 2019]. Another smallholder farmer by the name of Jeremiah also hinted that their crops are often unable to reach fruition because of the lack of sufficient rain. This is posing a serious challenge to him as a farmer because he is often unable to reap his targets and expectations. This is what Jeremiah had to say: In terms of farming, we now have a situation whereby our crops often die before we reap because they will be receiving insufficient rain. This is mostly the case with maize which we usually plant after the first rains but it has become a norm that the rains are not sufficient and sustainable enough. Such that in most cases we do not reap the amount of maize we used to reap years back because some portions will die entirely and others will partially survive. [Jeremiah: In-depth interview July 2019]. Numerous farmers confirmed that October was the month in which first rains were expected in previous years. Some further explained that the rains were not sufficient to kick-start ploughing but they were just a hint that we should get ready. They were referred to as bumharutsva or gukurahundi in the Shona language. After receiving these rains farmers would begin to prepare for the season. To adequately explain this, one of the participants had this to say: …also, October was the month we knew without fail that the rains would start falling. But please note that this was not rains to start serious farming, it was mvurayekutokonyamurimi (rains to awaken the farmer) and we called it gukurahundi or bumharutsva. Now this has changed. It is no longer predictable such that in some cases we receive bumharutsva/gukurahundi in December or beginning of January. So imagine what that means to me as a farmer, it is a huge challenge. [Jacob: In-depth interview July 2019]. Another smallholder farmer, Melania, concurred with Jacob: …the manner in which we receive rains these days has completely changed from previous years. This is because some time back when we were young we used to receive more and sufficient rainfall than we receive now and even the harvests were satisfactory. The first rains we received known as gukurahundi would come in October and that was a sign that we should get started as farmers. [Melania, 84 year old woman: In-depth interview July 2019]. (...) The drying up of rivers has been widely considered to be an effect of climate change by numerous participants. The narrative on the change in weather conditions was backed by the observation that many rivers are drying before their time to dry comes. Numerous participants concurred that what they witness currently in terms of the rivers is a new phenomenon. The argument was that going back to the 1990s, rivers could flow up to the next rainy season but now they dry around June. One of the participants revealed that the changes in weather conditions they are witnessing are devastating and they are real. The participant made a comparison between the time he moved to Mutoko and now. The comparison revealed that the rains they receive now are very low compared to the rains they used to receive back then. The participant also mentioned the rivers with specific emphasis on the local Nyamuzizi river which they heavily rely on for a number of domestic activities. This is what the participant had to say: There is a huge change in weather conditions because at the time we started staying in this place we used to receive more and sufficient rainfall. This change we face now I can say we started noticing it around the early 1990s. So since then, our produce began to fall and you can imagine there is a time you have to depend solely on agriculture such that after selling our produce we would have sufficient money for children's school fees and other basic needs at home. However, now we are unable to take our children to school because of such challenges and the seasons are changing rapidly. If you look at it now for the past two or three years, the rivers around us have not had enough water to sustain us throughout the year like it used to be many years ago. [Richmond: In-depth interview July 2019]. The early drying of rivers has severe effects on the livelihoods of the community because they heavily depend on river water for most of their domestic activities. In support of this another participant, a smallholder farmer, had this to say: …we face challenges of lack of sufficient rains such that the wells, rivers and dams we depend on are no longer enough because most of them dry before the next rainy season and this poses serious challenges on us as smallholder farmers. [Tanisha: In-depth interview July 2019]. (...) Many participants indicated that there are numerous effects that climate change has on their livelihoods. They know that agriculture forms the backbone of the community and its failure would mean tragedy to the people. One of the commonly reported challenges imposed by climate change is food security. (...) To elaborate further on food security and climate change, one of the participants had this to say: …The most obvious challenges that we face due to climate change is uncertainties as to where we are going to get food upon completion of the little that we have. Now every year that comes and passes, we are not certain whether the food we produced will sustain us till the year ends or not. This is because it is now a common phenomenon that we receive low rainfall and the production level is also seriously impacted. [Tilda: In-depth interview July 2019]. Another participant who concurred with Tilda on food security had this to say: One of the major challenges we

26	Indigenous knowledge in relation to climate change: adaptation practices used by the Xo Dang people of central Vietnam	Van Huynh, C.; Phuong Le, Q.N.; Hong Nguyen, M.T.; Tran, P.T.; Nguyen, T.Q.; Pham, T.G.; Khanh Nguyen, L.H.; Dieu Nguyen, L.T.; Trinh, H.N.	Heliyon	2020	10.1016/j.heliyon.2020.e05656	"To answer the question of their opinions on the climate change in the last years, most of the participants agreed that variability had become more extreme and more erratic within recent years (Figure 3). Nearly all farmers reported that there are three trends in seasonal climate change. While the frequency of floods, storms, rainfall, soil erosion and landslides tended to decrease, the average temperature and the number of droughts in the Tra Doc commune increased, according to respectively 63.09% and 91.42% of the respondents. The second trend showed that droughts in the area was increasing both in terms of intensity and frequency. As part of our survey involving individual households, it was demonstrated that 27.38% and 22.61% of the respondents agreed that droughts tended to increase considerably, while less than 12% of them suggested a decrease. Although the frequency of storms, floods, soil erosion, and landslides tended to decrease over the past ten years, these events were more intense when they occurred and their impact was more extreme. For example, over 60% of households reported that the floods' intensity was stronger and unpredictable than previously. Similarly, local people often mentioned the increase in the intensity, frequency, and duration of droughts. The climatic events adversely impacted on their livelihoods and daily activities. They also reported that although floods, heavy rain, landslides, and soil erosion were greatly affecting households during the period preceding 2017, their impact had appeared slightly lessened in the last two years. It was important to note here that storms usually occurred every two years, but the intensity of these storms was being noted as becoming increasingly more robust than the previous ones. 40% of the respondents said that the storms were stronger, 20% chose normal and the rest agreed to a slight decrease. In the interviews, the farmers often cited the typhoon Wipha (called storm No.3 in Vietnamese), occurred in 2015 as an example of erratic changes in extreme weather events' distribution and nature. (...) This means that they still rely significantly on their experiences based on personal physical observation of the environment. These ways of observing their natural world and harmonious ways of existing within this world has been passed along from generation to generation throughout time using an oral tradition. For weather forecasting, local people have developed personal techniques involving the keen observation of various faunal and floral movements, as well as being uniquely attuned to other physical changes in their surroundings, recorded in Table 3. For example, if banana buds are smaller and longer than usual, it indicates the coming of windstorms. The observation of the type of wet grass from the ground also strongly indicates the coming of rain. Also, the timing of the sprouting and flowering of certain trees such as palm trees can be an indicator of a coming drought. And the abundance or lack of "Trảo" (Cayratia japonica) leaves might indicate the impending floods. Moreover, the Xo Dang people can predict the occurrence of windstorms, rain, droughts, or floods by what they observe in the behavior of certain animals in their habitat. As the "Hoang Yến" birds (Serinus canaria) have been observed to fly back from the sea to the mountain direction, the windstorm occurs. The croaking of frogs also signifies the coming of rain. The patterns of ants or the flight patterns of dragonflies may indicate the coming rain. The disappearance of earthworms on the ground for a long time also strongly indicates the coming of drought. During our interviews, the people also shared the observation such as that if the beehives are situated in a low position in a given season, it is signal of a flooding upcoming. In addition to flora/fauna as an indicator, locals also rely on the personal observation of characteristics in the sky in order to determine the weather forecast. The observation is quite reliable and predictive. For instance, if the stars are not visible at night, it indicates the offset of rains. By contrast, if the stars are plentiful, it is an indication of the coming of sunny days. Dark clouds are considered to indicate heavy rainfall within a few hours. It is worth considering that the forecasting of weather is of particular importance at the time of post-harvest. Local people often observe the sky and natural phenomena very closely in order to promptly transport staple crops back from the fields. Given the importance of successful harvest to their livelihoods, they have developed a symbiotic and responsive relationship with their natural environments as a means of necessity. The key to indigenous climate change adapting strategies lies in effective weather forecasting. It helped them to plan their activities for at least few days in advance. This observation is extremely important when the weather forecast of professional agencies is not always updated or do not accurate for each climate sub-region".
6	Local perceptions of change in climate and agroecosystems in the Indian Himalayas: A case study of the Kedarnath Wildlife Sanctuary (KWS) landscape, India	Ogra, M.; Manral, U.; Platt, R.V.; Badola, R.; Butcher, L.	Applied Geography	2020	10.1016/j.apgeog.2020.102339	"Respondents were in broad agreement about the climatic and agroecological changes they perceived over the past 15–20 years, as well as the livelihood implications. In term of climate change, a large majority (>75%) of respondents perceived an increase in flash flood or landslide events, hailstorms, total annual rainfall, and drying springs (Fig. 2a). A large majority also perceived a decrease in winter snowfall. A majority (>50%) perceived an increase in average summer temperature, and perceived no change in winter temperature. In terms of agroecological change, a large majority of respondents (>75%) perceived increasing pests or crop diseases, crop failure, and crop raiding by wild animals (Fig. 2b). A majority (>50%) perceived increasing wildlife sightings in the village/fields and soil problems. Furthermore, a majority did not perceive a change in livestock predation or physical encounters with wild animals. The open-ended responses provided additional detail about perceptions of change. For example, respondents perceive that crop failure and decreasing crop yields are exacerbated by an increase in invasive plants and pests. Respondents believe that invasive plants such as basinga (Ageratina adenophora) and lantana (Lantana camera), have led to the "disappearance" of a local variety of grass called kumsya. Respondents also described a larval dung beetle (locally called ugyal) that prior to 4–5 years ago had been "previously unknown" in their fields. Many respondents connected increasing pests to climate change: for example, "Earlier soil was cold and sunlight was less and that kept control on insects and rodents – but today they are not disappearing even after pesticides" and "Snow fall was common and killed insects, but now everything has changed." Respondents provided details about their perceptions of increasing crop raiding and wildlife sightings. They cited specific problematic species including rhesus macaque (Macaca mulatta), Grey langur (Semnopithecus sp.), wild boar (Sus scrofa), Asian black bear (Ursus thibetanus), Himalayan porcupine (Hystrix brachyura), and various birds and rodents. Crop-raiding by monkeys on fruit trees was noted as a particular source of frustration. Several respondents also reported that they believed that mild winters had led to an increase in small rodents eating grain stores. Respondents made connections between landslides/flash floods and soil problems. As one resident explained, "Due to fast rain, fertile soil is running away and soil is no more fertile." Another concluded, "Weather is getting hot and glaciers are melting and forests are decreasing – This is the reason for landslide." Due to a perceived drying of springs, respondents were gravely concerned about water shortage for both people and wildlife. As one respondent put it, "If water channels will be dried, then how we will survive?" Another respondent stated: "If the situation persists, it will be difficult to survive." Finally, respondents were eager to discuss perceptions of environmental change that were not addressed directly by our interview questions. For example, many respondents were concerned about the state of the forests. Respondents emphasized the importance of forests (e.g., "Without trees there will be no life" and "Forests will disappear and life will be in danger") and blamed industry for deforestation (e.g., "Factories are increasing and forests are under pressure" and "Increasing industries and vehicles are causing pollution and deforestation."). Respondents also raised a litany of other problems including a general overuse of local natural resources, plastics pollution, an increase in packaged foods, and more disease – as well as a decrease in availability of traditional medicines and a reduced appreciation of elders' knowledge".

10	Coping with climatic shocks: local perspectives from Haiti's rural mountain regions	Staub, C.; Gilot, A.; Pierre, M.; Murray, G.; Koenig, R.	Population and Environment	2020	10.1007/s11111-020-00351-9	"Most groups indicated that yields of their major crops and livestock have decreased over the past 20 years. When asked to explain why yields were going down, men and women reported similar production challenges, many of which relate directly or indirectly to changing weather and climate conditions. Challenges to crop production were lack of rain, the occurrence of pests, excessive rainfall, hurricane winds, sudden shifts in temperature, diseases, availability of good-quality seeds, lack of irrigation, lack of capital, availability of labor, and poor soil quality. With regard to livestock production, frequently reported challenges were disease, robbery, hurricane-related deaths or injuries, drought, predation by feral animals, deterioration of forage, and sudden fluctuations in temperature. (...) Many different factors affect farmers' agricultural planning and ability to cope with weather and climate-related hazards. (...) Participants complained that temperatures are getting warmer, that there is less rainfall now than in times past, and that it is becoming more difficult to predict the onset and duration of the rains. This in turn influences what crops they grow and when they plant them. Crop selection is also influenced by seasonal demand, their market value, and the availability and quality of inputs such as seeds, animal feed, fertilizers, and pesticides. The availability of capital affects their ability to plan and purchase agricultural inputs and their ability to support other livelihood enterprises. Only the female groups mentioned the importance of planting crops that could be used for home consumption. They are concerned about the nutritional value of what they grow and use for home consumption. During dry periods, most groups reported experiencing yield loss due to reductions in the quality and/or quantity of agricultural produce. Crops die before reaching maturity either in plant nurseries or in the field (Table 2). Plant deaths in the field suggest that farmers may not always wait for the rains to start before planting. Plants that survive dry periods have lower yields because of lack of water or pest infestations. While livestock usually survive, the animals suffer weight loss due to less forage availability. To illustrate the impact, one farmer said: The animals could not graze: they didn't find any vegetation. Even people couldn't walk, it was so hot. There were people who felt sick. There were farmers who did not sow at all since it was so hot. Those who had land in shaded areas were able to get some yield, but profits were minimal after [accounting for the costs associated with] harvesting. (Kenscoff—Women). Women reported having to travel further to obtain water for drinking, cooking, washing, or irrigation if the household could not afford to buy additional water. (...) In times of drought and once harvests have failed, most groups reported waiting for favorable conditions and switching to crops that they believe better tolerate drought, such as plantains, or have a shorter growing cycle, such as leeks and bell peppers. They grow more traditional subsistence crops, such as tubers and roots, because they have a better chance to survive and can provide food for home consumption. They may have to sell animals or take a loan in order to purchase the inputs necessary to replant the new crops. Loans from banks, credit unions, and microfinance organizations are often associated with high interest rates and are difficult to repay. Participants mentioned that poorer farmers sometimes cut down trees for the production and sale of charcoal, indicating that drought is a cause of deforestation. Wet years were usually associated with hurricanes. Participants reported experiencing production and income losses and livestock suffering from disease. Farmers who lack the resources necessary to build an enclosure often tie up their animals to a pole, a practice which may cause drowning in times of flash floods. While male groups mostly discussed the challenges of flooding, uprooting, and destruction of crops during hurricanes (Table 3), female groups frequently stressed an increase in the frequency of livestock diseases including post-hurricane gastrointestinal and ear infections and flu-like symptoms in chickens".
6	An update on Inuit perceptions of their changing environment, Qikiqtaaluk (Baffin Island, Nunavut)	Sansoulet, J.; Therrien, M.; Delgove, J.; Pouxviel, G.; Desriac, J.; Sardet, N.; Vanderlinden, J.-P.	Elementa	2020	10.1525/elementa.025	"While many if not all Inuit agree that changes such as warming and melting ice are occurring, they also view these changes as an inevitability to which they must adapt. (...) However, Inuit of today have been reporting changes in weather predictability over the past 30 years. (...) The ice is changing; the flatness and the bumps are different than when I used to hunt. The ice is melting faster than it used to be, back then in 1970s. (. . .) Floe ice does not seem to come early anymore, because of the wind. (. . .) Faster melting and slower freezing. (Inuit elder from Kanngiqtugaapik). Inuit from all three communities are reporting changes on the ice as one of the major and most widespread changes to have occurred in recent decades (Video S1). The nature and stability of the ice is changing, along with the frequency and rapidity of the freezing of the ice, which is now also occurring later in the year according to locals. It is almost five months summer now. We use to have only four months per year summer. (. . .) It changed. The weather is warmer. (Inuit elder from Qikiqtarjuaq). (...) Back then, if we were in Arctic if it was a winter it would be –60 but at these days it seems to be going –40 and that environment seems to be changing [. . .] It's definitely getting warmer. And when someone is trying to build one [an igloo] they're having a hard time finding the right type [of snow]. You know texture of the snow is different now. The snow is softer now. (Inuit adult from Kanngiqtugaapik). These changes in temperature have been confirmed by our respondents in the three communities studied. They recall seeing many more glaciers when they were younger, or they see the changes based on what they have heard from elders. Nowadays, our glaciers seem to be melting even further than we thought. Back then they weren't that much cracks or any other things that could make it more sensitive. (Inuit elder from Kanngiqtugaapik). According to our respondents, the character of the wind is also directly linked to how quickly the ice and the snow are melting. Nevertheless, opinions differ greatly on the changes observed in wind patterns over the past few decades. In Kanngiqtugaapik, for instance, some adults do not consider that there has ever been any change in the wind, whereas the elders consider that, in fact, the wind is effectively and rapidly changing. The wind is changing: back then, when the weather permitted it would be very nice all week day along. Nowadays it seems to be a wind that pass every three or four days. Back then, it used to be one week long. Nowadays there is more wind than it used to be. (Inuit elder from Kanngiqtugaapik). People says weather is changing faster. Sometimes it is harder to go out hunting by skidoos because people have accident, they do not survive because the ice is thinner and thinner. Some people got lost, they go down, the ice is too thin, they don't survive some people survive some other lose everything. There are more accidents than before. (Inuit adult from Pangniqtuuq). Nowadays it's very sensitive to cross the glaciers or just to drive close to it. It's getting dangerous now. It's very important not to drive too close to ice glaciers. But if it's on the ice like the floe edge ice, it'll be alright unless it's springtime. (Inuit elder from Kanngiqtugaapik). The melting of the ice and the change in the stability of the land and the sea ice poses a real problem for hunters who are being forced to alter their usual routes in order to avoid the most "sensitive" areas caused by new cracks in the ice. Such travel route changes can lengthen the duration of the hunt and the distance traveled by hunters in order to reach an area of interest for hunting. Similarly, another important and often overlooked consequence of the changing icescape is that uncertainty increases, which contributes to a general feeling of danger or lack of safety. Furthermore, the communities rely on the experience and knowledge of the elders and of the adults who have been hunting all their lives, and are still able to go hunting. As uncertainty and dangerous conditions on the ice increase, however, people become less active on the ice, including young people. Younger generations are thus losing important learning experiences from the hunt. (...) The observations made by Inuit from the three communities studied indicate a significant change in the types of species hunted (Video S1). Indeed, in the three communities, the disappearance of the caribou and the narwhal has been acknowledged. In Kanngiqtugaapik and Pangniqtuuq, some birds, like the Canada goose, the Arctic tern, and the snowy owl, are less visible than before. In Qikiqtarjuaq and Kanngiqtugaapik, seals, although still a main source of food, have become sparser and difficult to catch. A suspected reason for this behavior is phenological mismatch: We know that by March the seal pups are born to their moms between the sea ice and the snow so with climate change and the sea ice melting sooner than in the past, our diet is at peril. (Inuit adult from Pangniqtuuq). In contrast, some animals have become more present over the last decade. Many bird species, like cranes, geese (white goose, snow goose), seagulls in the winter, and some unidentified species of birds described as "westerners' birds" by an Inuit adult, have been sighted in the region. Fish, such as sardines, Atlantic salmon, capelins, more Arctic chars, and even a catfish (in Pangniqtuuq), were also spotted. (...) According to several Inuit interviewed, the warming has also had an impact on the animals and could be the reason for their migration. [Birds are] probably changing their routes because it's getting too warm, they're going to the cold climate. (Inuit adult from Pangniqtuuq). (...) Observations by Inuit from Pangniqtuuq and Kanngiqtugaapik suggest that the effects of climate change on the ice and on polar bears are now being observed in the Qikiqtaaluk region, even though the findings are still mixed".

6	Fishers' perceptions and attitudes toward weather and climate information services for climate change adaptation in senegal	Diouf, N.S.; Ouedraogo, I.; Zougmoré, R.B.; Niang, M.	Sustainability (Switzerland)	2020	10.3390/su12229465	"Figure 2 presents the level of awareness of relevant weather information in the fishing sector. It appears that fisher-folks in the Great Coast are aware of the different type of forecasts, while in the Southern Coast, the level of awareness is lower; the difference observed between the area is statically significant. (...) Findings (Figure 3) indicate that 96% of fisher-folks perceive the change in the climate. Fisher-folk's perceptions of of climate change are based on climate related manifestations. Depending on the area, fisher-folks di erentiate the e ects of climate change. In the Great Coast, people perceive climate change through coastal erosion (37% of respondents), wind direction (32%) and increased extreme swell events (31%). Some people said that the coastal erosion (26%) and the accidents in the sea (20%) have occurred regularly during these last years. In the Small Coast, wind direction, increased extreme swell events, coastal erosion and sea level rise were mentioned. In the Southern Coast, respondents have pointed firstly the decreased fish population (21%), the disappearance of species (20%) and the change in wind direction (16%). In addition, 13% have enumerated the increased tides and 9% the increased extreme swell events. Regarding the estimated date they perceive these changes (Table 4), nearly half of fisher-folks confirm that they noticed changes over the past five years. About 25% of fisher-folks perceived these changes over the last 10 years, for 13% these changes had started 15 years ago, while 7% overall think these changes have occurred since 20 years ago. The trends on the onset of these changes are practically the same from one zone to another, except the southern Coast, where we note the greatest percentage of fisher-folks who stated these changes have happened since 10 years ago. Data from the focus group discussion confirm these results. Indeed, respondents explained the changes they have noticed on the climate during the last years and their consequences. The most notable changes are, among others, the coastal erosion and the sea level rise. The decreased rainfall is also cited by the respondents. For them, the rains were more abundant in the 1950s, while in recent years the onset of the season occurs in July with low intensity. This phenomenon amplifies and prolongs the e ects of the rise in the level of salinity, which has repercussions on the quantity of fishery resources as well as on their quality. Participants in the focus group discussions mentioned that the various changes have direct effects on household food security. (...) Fishing stakeholders in these di erent areas have pointed out a sharp increase in temperature with a high variability over time. They also argued that these various changes make di cult to plan their fishing activities: "in the end, we no longer know what to expect". A fisherman from the Great Coast (Saint Louis) noted that, in November in general, the cold weather favors the abundance of fish. However, with in increasing temperatures, there is no longer a cold period, thus causing a decrease in the fish population. In addition, according to participants, in the Southern Coast as well as in the Small Coast (Foundiougne district) where the inland fishing is practiced, the mangroves are also largely a ected by the e ects of climate change and are, as such, threatened with disappearance. One of the participants mentioned that "previously, it was possible to take landmarks with mangroves to navigate and orient themselves in the sea, but the loss of a large part of this resource entails the risk of being lost for fisher-folks". (...) Results show that people are aware of their responsibility to deal with the effect of climate change, wherever they are from (Table 5). They are willing to act toward resilient practices. More than 90% of the respondents enquire about the weather forecast before going to fish. This is confirmed by the participants of the focus group discussions. In addition, several people have decided to postpone their fishing activities during extreme meteorological phenomena".
6	Trends of climate change and variability in three agro-ecological settings in central Ethiopia: Contrasts of meteorological data and farmers' perceptions	Etana, D.; Snelder, D.J.R.M.; van Wesenbeeck, C.F.A.; Buning, T.C.	Climate	2020	10.3390/cli8110121	"In the household survey, the major climate-related events reported by respondents were climate variability (delayed onset and early termination of rainfall) and the occurrence of extreme events (Figure 7). (...) More than 90% of the household heads in each area reported delayed onset and early termination of rainfall. The percentage of household heads who reported drought was the highest in the lowland areas and it declined consistently as altitude increases. Frost and waterlogging were mainly the problem of farmers in the highland areas. Compared to the other two areas, the percentage of household heads who reported flood and snowfall was higher in the midland areas. (...) Farmers in the lowland areas stated the problem as follows: "it is lack of rainfall that makes us inferior to other people. Our neighbors in the other kebeles play with water. But, in this kebele, it is lack of rainfall that makes us and our children jobless; that changes our skin color; that changes our hair color to grey before we get old" [FGD-L-9]. Farmers in another village in the lowland area further explained that they are not able to benefit from their fertile land due to lack of rainfall saying that: "if there is rain, the hair even grows on the bare head of a person, let alone on this land. There is a lack of rainfall" In particular, lack of rainfall is most pronounced during the belg season in the three areas, due to which farmers indicated that they are forced to produce only once a year during the kiremt season, abandoning the production of belg crops. Farming in kiremt is also a ected by delayed onset and early termination of rainfall. As pointed-out by farmers, "the rain falls late after sowing time passes and due to early termination of rainfall, the farmlands get dry and crops do not grow very well" [FGD-M-7]. Similar to the results of the household survey, evidence from the FGDs indicated that extreme events occur in the study areas with varying magnitude. Drought was boldly stated by residents of the lowland areas as follows: "It is this problem [drought] that made us lag behind; that wasted our age; that depleted our resources. We have wide farmland; we are healthy. Our major bottleneck is drought : : : . drought made as beggars" [FGD-L-9]. Frost is mainly raised as a problem in the highland areas. Farmers explained that "it [frost] comes when the crop matures. When it comes, our effort of one year is damaged in one day" [FGD-H-3]. According to farmers' observation, though the cold period begins in November, it has become colder than in the past and the cold period starts as early as September. The other problem identified by farmers in the highland areas was waterlogging. The frequently mentioned extreme event in the midland areas was heavy rainfall in summer, which causes erosion and exacerbates the problem of a landslide. Farmers explained that "in the past, during the rainy season, there were foggy days with drizzle rainfall for the whole day that was conducive for agriculture. Now, rain falls heavily and erodes our soil, which also becomes a cause for a landslide" [FGD-M-5]. Farmers have developed traditional methods of forecasting weather conditions and making farming decisions. Owing to the absence of established means of knowledge transmission, these methods are not generally known in some villages. Farmers revealed that the local-knowledge-based traditional forecast system involving the observation of various signals is known only by few elderlies and that there is a generation gap in valuing the roles of these traditional forecasts in the usual farming activities. The information obtained from the traditional forecast is not considered to be dependable for farming decision making, as farmers said, as the observed weather condition deviates from the predictions based on traditional knowledge and expectations. Consequently, observing traditional signals is not an assurance that rain will come or will come at the expected time. The limited role of traditional methods of the forecast increases the demand for modern weather information for farming activities and climate risk management. However, the farmers noted that they do not have access to weather information. When it is available through media broadcasts, it is often reported at a higher spatial scale which, according to farmers, does not show the local weather condition and hence is not relevant for farming decisions. In addition, information on the expected time of onset and cessation of rainfall is generally missing in the weather forecasts of higher spatio-temporal resolution".
6	Using local ecological knowledge of Fishers to infer the impact of climate variability in Galápagos' small-scale fisheries	Cavole, L.M.; Andrade-Vera, S.; Marin Jarrin, J.R.; Dias, D.F.; Aburto-Oropeza, O.; Barrágan-Paladines, M.J.	Marine Policy	2020	10.1016/j.marpol.2020.104195	"The main effects of El Ni˜no on artisanal fisheries in Gal´apagos (Fig. 3a) were drawn from the fishers' perceptions of warmer seawater temperatures (very warm), of increased difficulty in fishing (less favorable), and of behavioral changes of fishes including them moving to further sites (fishes go outside), deeper sites (fishes go deeper) or simply not entering within the 40 nm of the Gal´apagos Marine Reserve – GMR (fishes do not enter). Moreover, half of the fishers identified rougher ocean conditions (wild sea) or abrupt changes in seawater temperature and in the ocean currents (abrupt changes) and higher precipitation levels (more precipitation) during El Ni˜no years. Interestingly, interviewed fishers also recalled specific El Ni˜no years and its main effects (1982/1983, 1997/1998 and 2015/2016) (Supplementary Table 1), as exemplified by the testimonial below: "I felt the El Ni˜no of 1982-1983 pretty strong. At that time, I was in San Crist´obal and I observed many changes in all activities within the Gal´apagos, affecting both marine animals and humans. In the marine realm, I observed that the winter season looked like the summer season. The water was very hot, the sea lions very weak, and the marine algae was dying, which affected the marine iguanas. I also observed that all the corals in San Crist´obal bleached, and a little less in Isabela. Since this El Ni˜no the corals have not fully recovered. This El Ni˜no affected fishing. For instance, the sailfin grouper (locally known as bacalao) went into deeper waters or it would leave the area, so fishing large pelagic fishes was a better option, like tunas. On the other hand, there was more jaiba (local crab). In the human realm, there were physical losses. There was a lot of heavy rain in San Crist´obal, destroying the Malecon (Boardwalk), and my aunt lost 3000 chickens." (code 10, Isabela Island). The main effects of El Ni˜no on marine animals (Fig. 3b) included the fishers' perceptions of the change of marine animal sightings (change sightings), the increase in the losses and mortality of specific marine animal groups (losses and mortalities), the overall negative effects in the entire marine food web (negative effects) and the reduction of small pelagic fish (pelagic fish) and pups and adults of sea lions (sea lions). In addition to specific El Ni˜no effects, we also asked fishers to expand on personal observations they considered of special interest. Two hookah fishers, an 82-years old and a 58-years old one, identified 'anomalous warm' years back in 1965 and 1968, when they were diving for the lobster fishery; "When I arrived in Gal´apagos, in 1965, I was diving, and I noticed that all the corals in the islands I used to fish were fully bleached because the water back then was very warm. I've seen the water get warm in posterior years, but in those years the corals would just partially bleach, which would allow them to recover later …" (code 04, Santa Cruz Island). Those years identified as anomalously warm by those two subjects correspond to the strong El Ni˜no events of 1965/66 and 1968/69 El Nino (Fig. 1c). These testimonials were also supported by other two senior fishers (72 and 74 years old) who identified the 1960s as decades with strong El Ni˜no years and anomalously high precipitation levels and lightnings. "The El Nino change the amount of fish, which decreases. But it is a natural process. In some places, like in the north of Isabela and Fernandina, and in Bolívar Channel, the water is always cold, even during El Nino years." (code 18, Santa Cruz Island). These sites are surprisingly the same ones identified as marine refuges under climate change due to the intensification and northward expansion of the EUC in the past 33 years [23]".

26	Climate change perceptions and challenges to adaptation among smallholder farmers in semi-arid Ghana: A gender analysis	Assan, E.; Suvedi, M.; Schmitt Olabisi, L.; Bansah, K.J.	Journal of Arid Environments	2020	10.1016/j.jaridenv.2020.104247	"All the study participants noted changes in rainfall and temperature from 2006 to 2016. As shown in Table 3, both men and women reported rising temperatures in the study communities and appeared to agree that the weather is becoming increasingly hotter. According to a key informant, the weather is becoming hotter because of lack of rain: When we were young, we had many rains so there was not much sunlight and heat stress. Nowadays, the heat is too much because there is no rain. (KII 04). A participant from the focus group discussions agreed with this claim and stated that: The temperature has been increasing over the period. When you have the rain then it will be cool, but because it does not rain, the temperature has gone up. (FGD 03). Both the men and women agreed that rainfall, which signals the start of the crop-growing season, has been occurring late in the year. The qualitative results support this view. Responses from the study participants suggest that farmers were previously certain about the onset of rains in March or April to begin their cropping activities. However, over the past decade, the rains usually began in May or June. A key informant made the following statement to demonstrate his observation: The rains usually start in March or April, but nowadays it begins in May or June. This year, we started planting our groundnut in May because the rain started in May. It rained for a short time and stopped … we have not had rain again. Our groundnuts did not sprout; June is about ending, we still do not have rain. We are waiting for the rain to replant the groundnuts. I have seen a difference in the rainfall pattern, and it is really affecting our farming. (KII 05). Farmers' observation about rainfall patterns suggest that rainfall is becoming unreliable. According to the study participants, the late onset of rainfall, low rainfall amounts, and sudden or intermittent stops in rainfall during critical growing periods make rainfall unreliable for crop production. The duration of the cropping season had generally decreased over the decade and was attributed to the late onset of spring rains. Men and women shared similar views on rainfall and temperature changes. And these views were consistent with scientific meteorological data. (...) Both men and women reported decreasing to unchanged trends in the occurrence of flooding in their communities. The focus group results indicated that flooding events were attributable not only to rainfall but to other activities, such as spillages from the Bagre dam (a dam in neighboring Burkina Faso and located north of the Upper West Region of Ghana) and poor channeling of waterways from farms during and after road construction. According to the study participants, there has been an increased incidence of dry spells and droughts in the past decade. These dry spells and droughts have been lasting between seven and 14 days, and in some cases, for about a month during the cropping season. The study participants attributed high temperatures and increased heat stress to reduction in rainfall events. Increasing windstorms during the cropping season were also reported as major climatic events undermining crop production and household well-being. The farmers reported that windstorms have become strong and frequent, and sometimes uproot trees and/or remove roofs of houses in the communities. During the key informant interviews and focus group discussions, participants reported local indicators that represented changes in local climate. These indicators were shortening of the crop-growing season; loss of vegetative cover, particularly in relation to the number of economic trees in the communities; drying up of streams; and reduced soil fertility. Additionally, the farmers reported reduction in game population; reduced population of migratory birds (that signal the beginning of the rainy season); and increased incidence of crop and animal pests and diseases (that were previously not common in the communities) as indicators of a changing climate. Other indicators included unexplained death of livestock, switch from cultivation of traditional varieties of crops to drought tolerant and early-maturing varieties, and stopping the cultivation of certain crops. Access to information on rainfall events and temperature during the crop growing season is crucial for farmers because it enables farm households to plan their farming activities: land preparation, selection of crops for cultivation, and application of soil amendments. The main sources of rainfall and temperature information (Table 4) for men were agricultural extension agents, radio, use of indigenous knowledge, and friends. For women, neighboring farmers, friends, agricultural extension agents, and use of indigenous knowledge were the main sources of information. The farmers largely attributed changes in rainfall patterns and temperature to bushfires and deforestation (Fig. 4). Some of the farmers stated that the changing climate was a natural phenomenon or due to God's will and the work of angry deities. There were marginal differences in perceptions of causes of climate change between men and women. Key informant interviews and focus group discussions indicated that the bushfires were largely due to farmers' traditional practice of burning crop residues to prepare the land for the next cropping season. Also, the bushfires were attributed to uncontrolled burning by men when hunting for game. Tree cutting by women for firewood, road construction, and site clearing for development projects accounted for deforestation and loss of vegetative cover. Further, certain traditional beliefs were perceived to influence the climate. For example, the changing climatic events were attributed to depletion of sacred groves and disregard for traditional practices. The farmers stated that failure to appease the gods when a sacred grove is desecrated displeases the deities, resulting in unreliable rainfall and increasing temperature. (...) Generally, there was a moderate to high level of concern for the impacts of climatic stressors on livelihood activities of the farmers (Fig. 5). The study participants were concerned about unpredictable rain, late onset of the rainy season, and droughts and dry spells. This situation is crucial because more than half of the participants indicated that they relied solely on rainfall for their farming activities. Both men and women showed less concern about heat stress, flooding, and emergence of new crop and livestock diseases. In the focus group discussions, participants indicated that heat stress, droughts and dry spells, and the emergence of new crop and livestock diseases were due to poor and erratic rains during the cropping season. They explained that good and regular rains during the crop growing season could result in lower temperatures and less incidence of crop and livestock diseases: The rainfall has been unreliable nowadays and has been affecting our crop yield. The rains are unpredictable, and there are long periods of dry spells that kill our crops. The temperature is always high nowadays because it does not rain properly. We have increased incidence of crop and livestock pests and diseases because of the dry weather. If it rains, the rain will wash the pests and diseases away. (FGD 02). In general, both men and women indicated that their crop and livestock production and household well-being were affected by the long-term changes in rainfall (Table 5). However, men reported greater effects (mean = 3.79, SD = 0.93) caused by these long-term changes than women. The participants stated that decreased crop yield, lack of fodder, and loss of crops and livestock to pests and diseases as climate change impacts on household crop and livestock production. Men and women reported similar effects of climate change on their farming activities and household. The key informant interviews and focus group discussions showed that the households experienced yield losses when there were prolonged periods of dry spells and shortened crop growing seasons. During periods of dry spells, household members walked for long hours in search of fodder to feed farm animals. In some cases, the animals are left to search for fodder on their own. These farm animals were sometimes stolen, resulting in losses. Loss of crops and livestock to pests and diseases, reduced or loss of soil fertility, loss of backyard gardens or farms, and low livestock productivity were other perceived effects of climate change reported by men. Women reported loss of livestock and crops to pests and diseases, low livestock productivity, reduced or loss of soil fertility, and stopping cultivation of certain crops as other effects of climate change. With respect to effects of the long-term changes on household wellbeing, both men and women reported of scarcity of food due to reduced yield or total loss of crops, reduction in number of meals eaten in a day, loss of income due to yield losses, poor health of household members, and scarcity of fuelwood. From the key informant interviews and focus group discussions, it was clear that men and women were vulnerable to climate impacts. The extent of vulnerability to climate impacts depended on the ability to diversify livelihood activities by engaging in other income-generating activities. A key informant explained: We have some women who are doing better than their men. You can have a woman who has strong labor and children and trades or engages in other businesses. Such a person has a higher chance of taking good care of the household than a man who is aged, has no other job, or has no children. (KII 09)".
10	Perceived Climate Variability and Compounding Stressors: Implications for Risks to Livelihoods of Smallholder Indian Farmers	Singh, R.K.; Singh, A.; Kumar, S.; Sheoran, P.; Sharma, D.K.; Stringer, L.C.; Quinn, C.H.; Kumar, A.; Singh, D.	Environmental Management	2020	10.1007/s00267-020-01345-x	"The Wilcoxon test indicated that farmers within PG 1 (deep black, Table 2) perceived that rainfall had become erratic over the period 2000–2015; that there were alterations in the onset and duration of different seasons and a decrease in the number of rainy days. Farmers within PG 2 (light black colour) perceived that while the duration of winter had significantly (p=0.05) decreased, there were visible changes in local weather as evidenced by early onset of summers and increasing frequency of drought events. In particular, farmers experienced extended dry-spells and droughts in 2000–2002, 2009 and 2012, while severe droughts were experienced in 2013 and 2014 (Table 3, Online Resource 1), but these were not recorded by planning and developmental agencies. Farmers within PG 3 opined that the frequency of rainstorms, flash floods and extended dry-spells had increased. Farmers also perceived rainstorms Phailin (2013) and Hudhud (2014), which were not reported in secondary data (Table 3, Online Resource 1), and farmers found it increasingly difficult to predict the weather using traditional indicators. Despite increased uncertainty, farmers still depend on 22 bio-meteorological indicators (Table 4, Online Resource 1), and knowledge of clouds and winds to predict local weather and rainfall patterns. For example, unseasonal/untimely appearance of insect pests is considered to be an indication of higher atmospheric humidity in otherwise dry months (Fig. 1a–c, Online Resource 2). Poor access to weather forecasts from formal sources further enhances uncertainty and greatly reduces farmers' choices in deciding on adaptation strategies, as they first need to know to what they are adapting. Farmers within PG 4 and 5 (indicated by the lightest black colour) perceived alterations in the occurrence of 'loo' (hot winds blowing during May–June), excess rains (but without any adverse impacts) and drizzling rains over the 30-year period (Table 2). Farmers considered 'loo' to be a reliable indicator of a 'good monsoon' (i.e., sufficient and evenly distributed rainfall). Drizzling rains (sawan ki jhadi, low intensity rains during August), perceived to be critical for the growth and productivity of rice, and in field preparation for Rabi (winter) season crops, water harvesting for irrigation and weed decomposition, have now become rare. The importance of drizzling rain is reflected in a local folktale 'Yadi purva aur uttara baras jati hai, to kisan ko pure saal khushal kar jati hai'…. [Drizzling rains in ashlesha (rainwater is considered to be of average quality) and magha (good quality) constellations (in August) are important for the year-round happiness of the farmers] (Key informant: Pujari and Mahajan, April 2014). (...) The majority (62.4%) of farmers perceived that rainfall had become 'erratic', while 26.6% perceived 'less rainfall' and 5.0% perceived 'excess' rainfall between 2000 and 2015 (Fig. 2, Online Resource 2). A good harvest of two local millets is virtually synonymous with a good monsoon as summarised in the following folktale: 'Sanwa, sathi (bhandai) 60 din, barkha pawe raat din'… [If sanwa (Echinochloa frumentacea) and bhandai (rainfed paddy variety) receive even modest but continuous rains during July–August, they will mature within 60 days (Key informant: Mahajan, August 2014)]".

6	“We Will Always Ask Ourselves the Question of How to Feed the Family”: Subsistence Farmers’ Perceptions on Adaptation to Climate Change in Burkina Faso	Sorgho, R.; Mank, I.; Kagoné, M.; Souares, A.; Danquah, I.; Sauerborn, R.	International Journal of Environmental Research and Public Health	2020	10.3390/ijerph17197200	"Farmers used the words “changement climatique” in French or “wakati/wagati yêlêma” in Dioula to express their first encounter with the concept of CC, followed by their understanding of its causes, their related experiences and their feelings about the changing climate. All farmers, except one, were introduced to CC through one of four sources: local radio show, informal discussions, provincial service agents, and their own experiences. When asked “what is climate change” participants described (1) changes in their environment which occurred over several generations and (2) rapid unexpected meteorological and precipitation changes experienced now and in the recent past. One participant stated that climate change means he is no longer in an environment “like that of his grandparents. (Climate Change) are changes bit by bit along the time. The environment we grew up to find, is now over, (no longer exists)” (25SRE_villagechief, 80). Participants described the biosphere/environmental change as slow changes over decade long periods of time, effecting heat, droughts, dryness, deforestation and desertification conditions of the environment. Participants also described their understanding of climate change as a change in precipitation patterns and timing “before it was raining a lot and on time, but now in the recent past, it [rains] only between June and July. This shows that there is a change” (16KMD2_farmer, 30). Participants evoked unusual frequencies in meteorological events such as heatwaves and wind/sand storms, along with disturbances in the expected regions rain pattern and timeline. In discussing the causes of CC, the farmers’ responses aligned under two categories: CC is due to “Godly Actions” and/ or “Human Actions”. Farmers who thought of CC as a Godly action understood the phenomenon as a punishment due to human deviations from the general will of God (disobedience and hard heartedness), or communal failure to uphold the traditional lifestyle (unfulfillment of essential rituals and customs). “[Climate change occurs] because human beings have a hard heart. What God says to stop, we are not going to stop. If things do not please God, he will decide to punish us and if this punishment is not death, it will be the lack of rain or years with excess of rain, and our crops spoil. All this based on our work/actions. It is us who are not good, because there is too much bad faith/ill will among us. Meanwhile God is telling us not to be of bad faith, therefore the punishments bring about waste” (25SRE_villagechief, 80). Participants who pointed to human actions as the cause of climate change pin-pointed this in combination with nature-related actions. The abusive cutting of trees was cited as the primary problem. This was perceived to be due to growing village populations and an increased need for farming land, which leads to wood cutting and forest burning, resulting in desertification and droughts. “The causes (of climate change) are enormous. First of all, Man is the principle actor. With the increase in population, the needs of Man have become manifold. Because without money nothing can work. Whereas to have money you have to cultivate. To cultivate, you must destroy the forest, burn the trees and finally use the land as a field. Also, the machines, by the gases which they produce pollute the environment” (27SIN_farmer, 42)..Seven out of the 32 farmers were unable to give a reason for the changing climate, stating that they have no understanding of reasons why their environment is changing. Each of those participants linked their lack of understanding to a lack of formal education “... with the changes (between) before and now things are not the same, the impact it has, one cannot understand unless they were educated (7DMD_farmer, 45)”. Participants explained that their lack of formal schooling leaves them not fully understanding the impacts of climate change. These notions of lack of understanding translated into a feeling of helplessness. The farmers conveyed negative feelings about the changing climate and their current situation. They expressed discouragement, sadness, misery, weakness, and especially, fear with regards to their livelihoods, the food security of their households and their overall future. “One can say that it [climate change] scares us. Because in case of drought for example, we will ask ourselves the question “how to feed the family?” As with flooding, it is the same emotion of fear because we are heads of households. We will always ask ourselves the question of how to feed the family. So, it’s an emotion of fear that we have” (27SIN_farmer, 42)".
6	Traditional livelihoods under a changing climate: herder perceptions of climate change and its consequences in South Gobi, Mongolia	Mijiddorj, T.N.; Alexander, J.S.; Samelius, G.; Mishra, C.; Boldgiv, B.	Climatic Change	2020	10.1007/s10584-020-02851-x	"Herders generally agreed that there had been an overall change in all 8 climatic variables from 1995 to 2015. Most of the herders (93.7%, n = 30) thought that the winters were getting warmer and 78.0% (n= 25) reported that the summers were getting colder with some fluctuations. Similarly, 93.8% (n = 30) of the herders reported that the length of both the winter and the summer had decreased, with increase in the durations of spring and fall (Table 1). Some herders (n = 16, 50%) also reported thatwinter temperatureswere now more variable and, for example, that extremely cold days would occur more frequently. One interviewee (age 68 years) said, “Nowadays, we are experiencing such awkward seasonal shifts. Earlierwe used to have signs (light frost in the morning) to move to wintering camp. Now there are no such signs to move and prepare for winter. Winter temperature drop is not gradual as it was before. There are lots of fluctuations. I feel that the spring is prolonged with harsh windy days continuing for a long time. I did not feel summer warmth. Suddenly, very unpleasant hot days appear. All seasonal routines are distorted and it is hard to predict the weather” (Tost-Tosonbumba Nature Reserve herder, 68 years old). Summer precipitation (n = 28, 87.5%) and snow cover (n = 25, 78.1%) were reported to have decreased,which herder believed that it leads to decreased soilmoisture and shrinking river beds.On the other hand, 78.1% (n = 27) of the interviewees suggested that the intensity of rains had increased and the frequency of drizzle rains had decreased. Similarly, 78.1% (25) of the interviewees reported that the number of windy days had increased and that the winds had become stronger, especially during the dry period in spring (Table 1). Herders suggested that there was strong evidence of changes in more than eight climatic variables. Most (93.8%) herders reported that winters were starting later and more abruptly, whereas summer temperatures were generally cooler with prolongedwindy days along with a few extremely hot days. The herders reported a change in the timing ofmoving to their wintering camps. They reported (99% of respondents) that it used have be early winter cold signs for moving to winter camps such asmild frost in the morning and evening. Now, there is no sign while it was warmer; sudden abrupt cold appears. Thirty respondents (93.8%) reported that the areas receiving rainfall in Tost-Tosonbumba Nature Reserve had decreased. The patchy rains forced them to converge in the few areas receiving rainfall, leading to grazing conflicts among herders. Twenty-nine herders (90.6%) reported that the prevalence of prolonged dry periods, relatively less rain, and increase in the number of windy days had caused a reduction in grass cover and production over the years (Table 3). A majority of herders (90%) reported a decrease in water resources, intensified further by human activities such as mining and development in the area. In addition, thirty herders (93.8%) reported that due to shift in the onset of spring rains and an increase in the intensity of rains, pasture quality decreased, and soil properties and fertility declined. Eighteen (56.3%) herders reported that heavy, intense rains decreased rangeland plant diversity, whereas 13 (40.6%) reported a shift in abundance of plant forms with a decline in palatable herbaceous species and increase in unpalatable species. Twenty-five (78%) interviewees expressed that the decline in summer temperature may negatively influence vegetation growth. A 52-year-old interviewee said “Summer is crucial time for livestock to graze more to fatten up. Dull summers makes conditions worse by delaying grass growth and growth of the grass not being completed.” The majority of herders (n = 27, 84.4%) suggested that pasture yield/biomass was diminishing due to insufficient rains (amount and rain pattern) with intense prolonged wind. A 65-year-old interviewee reported “Weregularly monitor the weather because pasture is directly dependent on the onset of rain, and its amount and distribution patterns. If rains occur at the right time, in the right amount, and are properly distributed, our pastures are rich enough to sustain any number of livestock. But in the recent few decades everything has changed in reverse ways.” Both the individual interviews (78.1%) and the group discussion suggested that strong reductions in the snow cover had strong negative impacts on livelihoods as snow was an important source of water for herder families and livestock in winter."
6	Vietnamese smallholders’ perspectives on causes, indicators and determinants of climate change: implication for adaptation strategies	Hoang, H.G.	Climatic Change	2020	10.1007/s10584-020-02827-x	"Table 3 reports causes of climate change identified by smallholders. A high proportion of smallholders perceived that causes of climate change were ‘urbanization’ (93.5%), followed by ‘deforestation’ (85.3%), ‘air pollution’ (84.4%), ‘unappropriated dealing with agricultural wastes’ (82.4%), ‘excess pesticide use on farms’ (69.4%), ‘excess fertiliser use on farms’ (69.4%), ‘soil degradation by erosion’ (50%) and ‘excess pesticide use on farms’ (40%). The chi-square test showed that smallholders’ perception of climate change was statistically associated with these perceived causes of climate change. In contrast, ‘continuous cropping’ and ‘overgrazing’ were identified by a small number of smallholders as the causes of climate change, with 12% and 9.4% of respondents, respectively. Table 4 presents indicators of climate change as perceived by smallholders. The indicators identified by majority of respondents were ‘excessive lightening’ (91.2%), followed by ‘change in rainfall season length’ (90.6%), ‘frequent droughts’ (90%), ‘change in temperature’ (88.2%), ‘uneven rainfall distribution’ (85.9%), ‘rainfall amount’ (84.1%) and ‘frequent floods’ (82.9%). The chi-square test indicated that smallholders’ perception of climate change was statistically associated with these perceived indicators of climate change, suggesting that these criteria are likely to be the noticeable climate change indicators in the study region. In contrast, a small number of smallholders identified ‘climate-borne diseases and pests’ (31.8%), ‘change in health condition’ (15.3%), ‘change in agricultural output’ (14.7%), ‘late start of rainy season’ (7.1%) and ‘early cessation of rainy season’ (3.5%) as indicators of climate change. The chi-square test also indicated that smallholders’ perception of climate change was statistically associated with these perceived indicators of climate change, except the perceived indicator of early cessation of rainy season.

6	Assessment of climate change pattern in the Pauri Garhwal of the Western Himalayan Region: based on climate parameters and perceptions of forest-dependent communities	Jha, S.K.; Negi, A.K.; Alatalo, J.M.; Negi, R.S.; Patasaraiya, M.K.	Environmental Monitoring and Assessment	2020	10.1007/s10661-020-08575-w	"Nearly all respondents reported changes in the climate in the last 30 years, with their perception on variations in temperature indicating a significant change. Approximately 99% of respondents from zone B reported variations in temperature and 93%of respondents in zone A, but only 77% in zone C. The climate in zone C is mostly cold and humid, and change is not easily identifiable, which probably explains the lower proportion of respondents reporting variations in temperature. Variation in summer temperature was reported by most respondents in zone A (96%). The variation in overall temperature was reported to impose additional stress on villagers, which was compounded by association with, or dependence on, the climate-sensitive natural support system. A total of 100% respondents from zone A, 95% from zone B, and 58% from zone C reported stress due to temperature. Households in zones A and B rely on traditional agriculture for their livelihood, and respondents reported that variations in climate directly or indirectly altered their livelihood practice. Respondents in zones associated with agriculture and related practices thus reported comparatively more stress due to variation in temperature (Table 2). The respondents' perceptions of variations in rainfall were similar for zones A and B, with 100% of respondents in both zones reporting variations in overall rainfall, compared with 63% in zone C. Specific observations on rainfall intensity and variation in seasonal rainfall were mentioned more frequently by respondents in zones A and B. A total of 100% and 97%respondents in zones A and B, respectively, reported that the intensity of rainfall had increased in the past one or two decades and that the number of rainy days had decreased markedly. Approximately 98% and 90% of respondents in zones A and B, respectively, agreed that the number of rainy days had decreased significantly, although 27% of respondents in zone C did not reported any variation in rainfall. Variations in monsoon and winter precipitation were reported, with a total of 97%, 98%, and 83% of respondents in zones A, B, and C stating that monsoon precipitation had decreased. Variation in winter precipitation was more often reported by respondents in zone A (95%) and they said that this decrease in winter rain considerably affected wheat irrigation. However, 10% of respondents in zone B and 50% in zone C did not report any change. The overall variation in rainfall was reported to impose direct or indirect stresses to respondents that were directly proportional to dependency on climate-sensitive sectors. All respondents in zone A and 95% in zone B perceived stress due to variation in rainfall, compared with 67% in zone C (Table 2). The respondents had clear perceptions of climate change and most respondents reported significant variation in climate in the district. The respondents also reported impacts of variation or change in climate. Nearly all respondents in zones A and B reported significantly higher incidence of drought, while 55% of respondents in zone C did not perceive any change. The incidence and duration of cold waves were also reported to have increased in the district, but the proportion of respondents reporting higher incidence was substantially higher in zones A (100%) and B (92%) than in zone C (75%). Generally, variation or change in climate causes incidences of disease, with forced or sudden variation leading to more pronounce and frequent incidence of disease. Disease incidence also depends on adaptation capacity of an individual or community, and access to healthcare. However, despite better access to healthcare in zone A, all respondents reported increased incidence of disease, as did 98% of respondents in zone B, but fewer (53%) in zone C. One of the most challenging issues in the study region is forest fires, which can be influenced by change in climate, especially increases in temperature. Nearly all respondents in zones A and B reported increased incidence and frequency of forest fires in recent years, but fewer respondents in zone C reported higher incidence and intensity of forest fires (80% and 83%, respectively) (Table 2).
6	Assessing farmers' preparedness to cope with the impacts of multiple climate change-related hazards in the Terai lowlands of Nepal	Budhathoki, N.K.; Paton, D.; A. Lassa, J.; Zander, K.K.	International Journal of Disaster Risk Reduction	2020	10.1016/j.ijdrr.2020.101656	"Farmers were highly concerned about floods and less concerned about heatwaves and cold spells (see Table 2). The average risk perception index was higher for floods (14.5) than for heatwaves (11.4) or cold spells (10.9). Many respondents (78%) had experienced flood damage, while only 17% and 16% had experienced damages from heatwaves and cold spells in the previous ten years, respectively. Most respondents found existing coping mechanisms ineffective for any of the three hazards. (...) Farmers perceived a range of risks related to their farming (see Fig. 2). Approximately 80% of respondents reported that drought, heatwaves, cold spells, and floods were the main climatic risks, excepting for excessive rainfall. More than 90% of the farmers perceived environmental risk5 as the primary agricultural risk, followed by biological risk (72%) and financial risk (46%) (see Fig. S3 in the Appendix)".
6	Perceived livelihood impacts and adaptation of vegetable farmers to climate variability and change in selected sites from Ghana, Uganda and Nigeria	Fadairo, O.; Williams, P.A.; Nalwanga, F.S.	Environment, Development and Sustainability	2020	10.1007/s10668-019-00514-1	"In the three study sites, all the respondents had at one time or the other heard about changing climate and most of them reported not just hearing about it but know little or more about climate change. They had mostly experienced longer dry season, drying up of streams or rivers, warmer temperature and lower rainfall pattern (Fig. 2). Famers have also experienced strong winds, severe flooding, delayed onset of rainfall and harmful gas emissions as climate change parameters but on a relatively lower awareness rate. Irrespective of evidence of climate variability and change reported across the three study countries, a generally high awareness of the identified climate variability and changes were reported (Fig. 3). Respondents in Uganda specified the highest (78.3%) level of awareness, followed by Ghana and Nigeria. (...) Most of the vegetable farmers from Ghana and Nigeria perceived such negative climate impacts as high (Fig. 4). (...) Further, Table 2 shows the differences among the respondents from the three study locations in terms of their perception of impact of climate variation and change on their faming livelihoods. The table shows a significant difference among respondents from Ghana, Nigeria and Uganda ($F = 140.75$; $p < 0.05$) with respect to impact of climate variability on their livelihoods."
6	Changing socio-ecologies of Kalahari: Local perceptions towards environmental change and tourism in Kgalagadi, Botswana	Saarinen, J.; Moswete, N.; Atlhopheng, J.R.; Hambira, W.L.	Development Southern Africa	2020	10.1080/0376835X.2020.1809997	"Respondents' opinions were distributed quite evenly concerning their experienced changes in environment during the past five years (Table 2). Based on the open-ended follow-up question (N=134), the main perceived changes were weather and rainfall related: weather patterns were seen as changing, temperatures getting warmer and rainfall was considered more erratic. "
6	No safety net in the face of climate change: The case of pastoralists in Kunene Region, Namibia	Inman, E.N.; Hobbs, R.J.; Tsvuura, Z.	PLoS ONE	2020	10.1371/journal.pone.0238982	"About 67% of the respondents have heard of climate change (Fig 2A). The majority, including those who have heard of climate change, do not have an understanding of what climate change is and what causes it; thus, many expressed that it was not relevant to them. With regard to causes or reasons for climate change, many respondents (47%) did not know what causes climate change, and some (26%) expressed that it was caused by God (Fig 2B). More than half (52%) of the respondents noted that climate change was not really important to them (Fig 2C). The respondents were asked if they think anything can be done to tackle climate change. Many (39%) indicated that they do not know, and some (39%) expressed that there is nothing that can possibly be done to tackle climate change (Fig 2D). When climate change was explained to them, the majority of the respondents expressed that they have perceived or experienced climate change or variability, especially delayed rainfall (98%), lack of rain (100%) and change in the temperatures (76%). (...) Many expressed that though they have observed these changes, especially in the rainfall patterns, they did not understand why and what was causing all these changes (Table 2). The majority of the pastoralists noted that they had no access to climate change (scientific) information. There was an indication that some were willing to do something about it if they had enough knowledge of what was expected of them. A 64-year-old pastoralist expressed that: "First of all, we need an understanding of what climate change is, what causes it, etc. We need to understand what brings rain, so that if there is something we are doing that is stopping the rain, then we can stop doing it. If there is something we can do to bring the rain, then we need to know so we can do these things. Without understanding, we cannot do anything at all" H2. (...) Many respondents indicated that the climatic changes they have experienced have negatively impacted their lives; many complained of impacts such as drought, flood and high temperatures. Other impacts that were mentioned included diseases, hunger for both humans and animals and poverty (Fig 3)."
6	Heat, cold, and floods: exploring farmers' motivations to adapt to extreme weather events in the Terai region of Nepal	Budhathoki, N.K.; Paton, D.; Lassa, J.A.; Bhatta, G.D.; Zander, K.K.	Natural Hazards	2020	10.1007/s11069-020-04127-0	not applicable
6	Vulnerability of the Açaí Palm to Climate Change	Tregidgo, D.; Campbell, A.J.; Rivero, S.; Freitas, M.A.B.; Almeida,	Human Ecology	2020	10.1007/s10745-020-00172-2	"Over half (62%) of those asked (n = 184) had heard of climate change. When asked how temperatures had changed since the year 2000 (n = 424), 93% said they had increased, 4% said they had not changed, and 2% said they had decreased. (...) The respondents of the 24 açaí-specific interviews generally felt that summers are getting hotter (91.7%) and that açaí production fell during hot years (87.5%), by a mean of 22.2%. (...) A minority of respondents believed that years with less rainfall (47.6%) or more storms (30.4%) affect açaí production, with all but one who claimed it increased also claiming that production is reduced in these years."

6	Documentation and validation of climate change perception of an ethnic community of the western Himalaya	Sharma, A.; Batish, D.R.; Uniyal, S.K.	Environmental Monitoring and Assessment	2020	10.1007/s10661-020-08512-x	"Detailed interactions with the selected 240 respondents revealed that Bhangalis perceived 11 indicators of climate that have changed over a period of two to three decades (Fig. 3). “Decrease in snowfall” was the most prominent indicator as it was reported by the maximum number of respondents (~ 97%). It was followed by “increase in crop disease/pest attacks” (~ 82%), “decrease in monsoon rainfall” (~ 76%), and “decrease in water level” (~ 76%) that refers to reduced water in streams and also drying up of water sources. Sixtynine percent of the respondents reported trends of “increasing temperatures”. An “increase in dry period” was reported by ~ 65% of the people while ~ 47% noted a “decrease in winter rainfall” (Fig. 4). (...) “Changes in phenology” and “early crop maturity” were reported by ~ 34% and ~ 11% of the respondents, respectively (Fig. 4). While all the 240 respondents could easily relate to changing climatic conditions and its indicators, ~ 27%had limitations with the technical term “climate change. (...) The causes of changing climate as reported by the Bhangalis can be grouped into six categories namely; changing lifestyle, deforestation, developmental activities, overexploitation, pollution, and overpopulation (Table 3). Majority of the respondents (~ 35%) believed that overexploitation is a prime contributor towards changing climatic conditions. This was followed by developmental activities (~ 26%) wherein people opined that construction of roads, dams, and resorts are adding to it. Pollution (~ 6%), changing lifestyle (3%), and overpopulation (~ 0.4%) were the other reasons cited by the people as causes of changing climate (Table 3). The respondents perceived that the changing climatic conditions are impacting their livelihood in four major sectors i.e. agriculture, socio-economy, cultural/traditional practices, and health (Table 4).”.
10	Climate Change Grounded on Empirical Evidence as Compared with the Perceptions of Smallholder Farmers in Vhembe District, South Africa	Kom, Z.; Nethengwe, N.S.; Mpandeli, S.; Chikoore, H.	Journal of Asian and African Studies	2020	10.1177/0021909619891757	"The findings of the results revealed that 80.5% of the farmers were aware of the different aspects of climate change, for the past decades. Farmers’ perceptions regarding climate indicators, correlated with both temperature and rainfall (see Table 2); therefore, most of the smallholder farmers’ responses showed that the rainfall is unevenly distributed from one area to another, when the temperature increased. However, 19.44% of the farmers felt that the rainfall volume was unchanged. The most visible change in climate for about 80% of the farmers was a shift in the start of rainfall; 82% of respondents said they had noticed that rainfall on-set currently was late as compared to the past three decades. Furthermore, 90% of smallholder farmers perceived the rainfall season getting shorter over the past 35 years. (...) The concern among smallholder farmers is the local climate variability and changes that are affecting crop production, which they depend on for their livelihoods. A substantial number of 80.4% of farmers perceive high-volume floods and few dry spells as evidence of climate stressors and this is affecting the growing season as they were obtaining less produce. (...) During these sessions, respondents were very categorical that there are changes in terms of rainfall which seems to be decreasing during the summer seasons. (...) The majority of the smallholder farmers reported a decrease in rainfall and increasing temperatures. (...) Temperature increases were the major visible climate change as respondents indicated that temperatures have been constantly increasing for the past seasons. (...) During the FGD, smallholder farmers reported that there was a late start of rainfall and early cessation, as compared to the past years. (...) The findings revealed in Figure 8, indicate that the majority of the farmers have knowledge about and are aware of change in local climate as well as its effects, through their knowledge and experience. The findings derived from the results revealed that 40.5% of respondents were aware of climate change through listening to radio, while experience or personal understanding of climate change was ranked the second in terms of access to information on climate by 23.1%. Television communication was indicated by 17.1% as a source of information by the farmers. Other sources of information such as, newspaper, meteorological bulletins, agricultural extension officer, neighbours, NGOs, religious bodies, village meeting, educational seminars, were not selected and there was no access to information through the internet for the respondents."
6	“Bring fishermen at the center”: the value of local knowledge for understanding fisheries resources and climate-related changes in Lake Tanganyika	Bulengela, G.; Onyango, P.; Brehm, J.; Staehr, P.A.; Sweke, E.	Environment, Development and Sustainability	2020	10.1007/s10668-019-00443-z	"Fishermen noted that, in the past winds were much stronger compared to recent years. They noted a general decrease in intensity/ velocity of all types of wind. Fishers started to observe this change in the 1990s. (...) Although they may not directly attribute these changes to the concept of “climate change,” fishermen do understand the implications of changing weather patterns over time and the linkage between those changing patterns and their ability to have a successful and productive fishery.(...) Similar to their perceptions about changing winds, respondents noted decreases in rainfall when they compared the past and the present state of rainfall. Fishermen noted that they started to observe this change early in the 2000s. It was revealed that in the past, “masika” (rainy season) was between October and April. When they recalled the state of rainfall in those days, some members of the fishing communities of Kigoma referred it as “kilikuwa ni kipindi cha neema za mvua”—it was the period of rainfall blessings; inferring that rainfall was sufficient and evenly distributed. More recently, fishermen noted that rainfall has become very unpredictable and does not coincide with the historical seasonality of rainfalls. Mzee Ali commented; In the past there was sufficient rainfall not like these days. As I remember there was a serious shortage of rainfall in our region and in some parts of Tanzania in 1984. That year was very terrible, we experienced hunger in most parts of Kigoma (huo mwaka ulikuwa balaa, maeneo mengi ya Kigoma kulikuwa na njaa). But this was not common. Nowadays the state of rainfall is unpredictable. It is normal thing for rain to delay or to rain only for a short period than the normal rain season. You can see for example this year (2016) it is like there is no rainfall;…. today is November 10 and there is nothing while in the past it was raining from the end of September or early October and in some years it could go up to June (IDI/elder/Muyobozi). When respondents were asked about the possible reasons behind the change in rainfall, there was a divide between elders and youth. Most elders attributed the problem to the “will of God” (maamuzi ya Mungu). God is believed to guide everything that is happening; he gives things by his own will; “it is God who takes care of rainfall and everything in the universe” (….maana milango ya mvua na sisi sote, vinaangaliwa na Mungu). In contrast, most youth who were asked about the possible causes of shortage of rainfall mentioned “mabadiliko ya hali ya hewa”—“climate change” something that very few elders mentioned. Youth’s perception about rainfall might be influenced by their wider exposure to information, particularly in the current situation where global climate change is a crucial topic of discussion in the media and among policy makers and managers such as government and non-governmental organizations dealing with environmental issues. This was the first instance where the scientific concept of “climate change” was mentioned by name by any respondents. (...) Despite the differences in perception, both elders and youth acknowledged changes in rainfall patterns."
6	Farmers’ perceptions and adaptation strategies to climate risks and their determinants: insights from a farming community of Aguie district in Niger	Ado, A.M.; Savadogo, P.; Pervez, A.K.M.K.; Mudimu, G.T.	GeoJournal	2020	10.1007/s10708-019-10011-7	"The farmers commonly note that climate change risks are related to rainfall variability including the shortening of the rainy season and increased frequency of floods, increased frequent drought, higher temperatures and increased wind speeds, increased pests and diseases, and reductions in crop yields. However, perceptions of the importance of these risks differed across the villages and among the farmers. In both villages, all of the farmers unanimously agreed with rainfall variability being the most important climate change risk. However, in Guidan Kodaou village, during the group interview, farmers ranked the risks in the following order of importance; increased pests and diseases, crop yield changes, frequent drought, rainy season duration, and higher temperatures and wind speeds. In contrast, in Guidan Dan May Gari village the risks were ranked in the following order; rainy season duration, frequent drought, higher temperatures and wind speeds, and increased pests and diseases. The farmers’ climate change risk perceptions are summarized in Table 2. (...) Most of the respondents perceived a medium risk related to increases in temperature and the frequency of pest and disease outbreaks (i.e., 30.5% and 35%, respectively). However, many perceived that rainfall variability (40.00%), drought frequency (35.60%), wind speed (38.80%), crop yield (25.60%), and rainy season duration (28.20%) posed a low risk in the study area. Most of the respondents believed that rainfall amount (65.30%) and rainy season duration (62.60%) had decreased in contrast to temperature patterns. (...) During the individual interviews, many farmers relayed their perception of changes in climate patterns. These reported changes are reflected in the comments of one tribal leader (i.e., Hardo) from Guidan Kodaou village, who was widely regarded by other farmers as a reliable source of information about climate patterns in the region. Hardo reported that—‘‘the climate is changed compared to previous years and this change started about 30 years ago. Nowadays, the temperature is becoming higher, the wind quite strong and rainy season quite short. The rainy season began late and ended early, but rainfall amount is approximately the same, the only problem is that it’s not well distributed over time and space)’’. Hardo’s comments were based on observations that included the behavior of certain plants and animals during specific periods (to determine the start and end of rainfall season and the amount of rainfall, wind speeds, and temperature increases), the movement of the sun from north-tosouth (to determine the start and end of different seasons), the movements of stars from east-to-west (to measure the duration of seasons) and lunar length intensity (to measure sunshine intensity). (...) Ali, old farmer (93 years old) from Guidan Dan May Gari confirmed Hardo’s perception of changes in the region’s climate patterns regarding temperature (e.g. ‘‘nowadays the cold season is less cold and the dry season is warmer’’) and Hima (representation of extension service at rural area and member of farmers association) explained the link between temperature and rainfall by the decrease in soil moisture (e.g. ‘‘the more the rainfall amount during the rainy season, the lesser the temperature is higher during the dry season and vice versa’’). (...) Some farmers reported that previously the rainy season started in the seventh month of the lunar calendar (In Hausa the local dialect, ‘‘Watan Bakoye’’) that coincides with the end of April, but now it starts around the end of May and early June. The farmers highlighted this by a local idiom ‘‘Watan bakoye manzon ruwa, ko ba ruwan akoy alama’’ which means that the 7th (lunar) month is a symbol of a rainy season, and even if there is no rain, there are at least it’s preceding signs."
2	Community perceptions on climate change and natural resources degradation in a tribal context: An empirical study in koraput, odisha	Prakash, R.J.; Damodar, J.; Nibal, D.	Disaster Advances	2020		"Focus group discussion with farmers and women revealed that the major perceptions about climate change and natural resources degradation over the last 30 years were: delayed monsoon, reduction in rainfall quantity, reduction in number of rainy days, increased incidence of rain during harvest, increased temperature during Kharif period, increased loss of top soil, declined streams flow and declining surface flow of streams. (...) More than 90 per cent of respondents have reported that there has been an increased incidence of rainfall during harvest in the last 5-10 years and the surface flows of streams have gone down. Similarly, more than 90 per cent of respondents have expressed that there has been a reduction in rainfall quantity and rainy days, flow of streams and an increased temperature, and increased top soil loss during Kharif."

6	Life in riverine islands in Bangladesh: Local adaptation strategies of climate vulnerable riverine island dwellers for livelihood resilience	Sarker, M.N.I.; Wu, M.; Alam, G.M.M.; Shouse, R.C.	Land Use Policy	2020	10.1016/j.landusepol.2020.104574	"Climate Change Perception Score (CCPS) and Climate Change Perception Index (CCPI) were calculated to describe the perception of char dwellers on climate change impact. The calculated Climate Change Perception Score (CCPS) is ranged from 549 to 1068. That means the char dwellers are very much sensitive on the impact of climate change. (...) However, the calculated Standard Climate Change Perception Index (SCCPI) is ranged from 48.92–95.16 which mean most of the char dwellers belong to high perception index".
6	Exploring fishermen's local knowledge and perceptions in the face of climate change: the case of coastal Tamil Nadu, India	Madhanagopal, D.; Pattanaik, S.	Environment, Development and Sustainability	2020	10.1007/s10668-019-00354-z	"Senior fishermen elaborated on how climate change impacts over the last three to four decades have affected their livelihoods and how it further has impacted the fish distribution and stock in their traditional fishing grounds. (...) Based on age, the senior fishermen were of the similar opinion that climate change is a reality and it has had direct impacts on the less fish catch. As shown in Table 4, irrespective of the differences in age groups, majority of fishermen primarily reported the changes in the weather and climate patterns over the years, and the denial of climate change effects on the fish decline was negligibly less. Fishermen stated that the climate variations including the increase in the temperature during the summer season and the increasing droughts over the years are the main reasons for species decline and the less fish catch over the decades. Senior fishermen noted that the extreme climate events and the chaotic weather patterns were used to be normal before 3 days, but the intensity and the frequencies of the events have become more, especially since the 2004 tsunami. Majority of fishermen did not singly link that the changes in weather and climate patterns
26	Using farmer-based metrics to analyze the amount, seasonality, variability and spatial patterns of rainfall amidst climate change in southern Ethiopia	Cochrane, L.; Lewis, S.C.; Engdaw, M.M.; Thornton, A.; Welbourne, D.J.	Journal of Arid Environments	2020	10.1016/j.jaridenv.2019.104084	over the years are the only reason for the less fish catch. Instead, they integrated the climate change effects with overfishing and noted that such combined forces over the decades had exacerbated their livelihoods stress, and it gets more increased due to the impacts of climate change. Almost all the fishermen who participated in the study expressed concern and fear about the increasing intensity of climate events and the resulting livelihoods insecurity over the years. In the interviews, of the forty senior fishermen, around thirty-five senior respondents noted that climate change has been one of the two primary reasons for the continuous fish decline and the resulting less fish catch, whereas the remaining four senior respondents noted that over-exploitation had been the primary reason for the declining fish catch over the decades. It should be noted that those senior respondents, however, did not deny the changes in climate patterns over the decades (Table 4). (...) Few climate change impacts that fishermen collectively stated were unpredictable weather patterns (mostly high and strong tides), irregular wind patterns, erratic monsoon, extreme temperatures in the summer seasons (also extension of the summer season), drought, coastal erosion and increasing salinization of groundwater. In the focusgroup discussions, the senior fishermen provided various insights into the broad impacts of climate change on their fishery livelihoods. Almost all the senior fishermen who participated in the focus-group discussions were aware of the fluctuating environmental conditions for over the past three to four decades and its negative impacts on their fishery livelihoods and coastal spaces. All the senior fishermen reported that seasonal anomalies and the wild weather patterns were the primary factors that decreased the fishing days, but intensified their risks for over the last 15 years. (...) Many senior fishermen (n = 25) across the study sites stated that the frequency and intensity of rains for over the last 15 years were lower than in the previous decades. But during the primary survey, it was observed that locals' observations of rainfall and climate events were often inconsistent among the others. They had limited memory to pinpoint the nuanced details of the climate events and the intensity of rain falls for over the last three to four decades."
11	Changing climate - Changing livelihood: Smallholder's perceptions and adaption strategies	Funk, C.; Raghavan Sathyan, A.; Winker, P.; Breuer, L.	Journal of Environmental Management	2020	10.1016/j.jenvman.2019.109702	"The vast majority of the households have at least medium to high levels of perception of the situations highlighted in the five questions. For example, more than 97% of the survey participants recognize a considerable rise in temperature, an increase in hot months and an increase in rainfall. At the same time, 87.5% of the households perceive low to medium levels of erratic rainfall, whereas almost 90% recognize a substantial decrease in rainy days. Farmers perceive medium to high levels of "considerable rise in temperature" and "increase in hot months". (...) More than 66% of the households opine medium to high levels of perception regarding the "increase in rainfall" parameter, and 87% have experienced low to medium levels of erratic monsoon incidences. "
6	Dealing with climate change in semi-arid Ghana: understanding intersectional perceptions and adaptation strategies of women farmers	Lawson, E.T.; Alare, R.S.; Salifu, A.R.Z.; Thompson-Hall, M.	GeoJournal	2020	10.1007/s10708-019-09974-4	"Many farmers perceived a change in temperature, rainfall patterns and the frequency of dry spells. Temperatures were perceived to have increased (Fig. 2) and were seen as a source of stress on groundnut production as respondents linked this with several challenges such as crop failure due to withering and drying of crops, poor germination, pest and disease infestation (especially from aflatoxins), and physical difficulties of working on farm. A 65-yearold woman (Kalsagre-Lawra) mentioned during the FGDs that ''… temperatures are very high compared to two or three decades ago, and when I go to my farm on a hot day I cannot work because I will become sick…'' Respondents' perception on rainfall shows that a decreasing trend was perceived as being the norm, with those married, people who were born in the communities) and those in the 20–30 years and 41–60 years age bracket more likely to believe that the rainfall had become more erratic (Fig. 3). Usually, when the rains come and we sow our seeds, by the time our seeds start to germinate, the rain ceases. These bring so much heat and our seeds are being scorched by the sun. Sometimes too, we can't immediately harvest our groundnuts during harvest periods because the soils are often not moist and loose enough to pull out the groundnuts due to insufficient rainfall. (A 54-year-old woman from Ketuo-Nandom). Truly the climate is changing because things are not the same as they were before. In the past, we had regular rainfall patterns- the rains fell by May and ended in October. We are currently not experiencing the early rainfall. The rains start late, are erratic and end early with accompanying heat. (A 61-year-old woman from Goziri-Nandom) Drought was identified as one of the main threats to agriculture in the area, however drought occurrence was perceived to have become intermittent in the study areas. Dry spells were occasional (Fig. 4). Increasing temperature and erratic rainfall have been associated with poor seed formation, wilting and crop failure, thereby threatening household food security (Fig. 4)."
6	Local knowledge based perceptions on climate change and its impacts in the Rakaposhi valley of Gilgit-Baltistan, Pakistan	Bhatta, L.D.; Udas, E.; Khan, B.; Ajmal, A.; Amir, R.; Ranabhat, S.	International Journal of Climate Change Strategies	2020	10.1108/IJCCSM-05-2019-0024	"About 93 per cent of the respondents argued that they witnessed an increase in mean annual temperature over the past 25 years, perhaps due to climate change (Figure 2). (...) About 90 per cent of respondents stated that the precipitation pattern has changed in Rakaposhi Valley over the past 25 years (Figure 4). Majority of the respondents indicated that they have witnessed an increase in rainfall during winter and spring, whereas a decrease in summer rainfall. On the other hand, 59 per cent respondents indicated that there has been no snowfall during early winter and 65 per cent believed that there is only less snowfall during the mid-winter season. (...) In terms of hazard risks in Rakaposhi Valley, majority of respondents reported that the frequencies of avalanches, landslides and floods have increased, whereas droughts, flash floods and glacier lake outburst flood (GLOF) events decreased over the past 25 years (Figure 6)."
10	Community perception, adaptation and resilience to extreme weather in the Yucatan Peninsula, Mexico	Metcalfe, S.E.; Schmook, B.; Boyd, D.S.; De la Barreda-Bautista, B.; Endfield, G.E.; Mardero, S.; Manzón Che, M.; Medina González, R.; Munguia Gil, M.T.; Navarro Olmedo, S.; Perea, A.	Regional Environmental Change	2020	10.1007/s10113-020-01586-w	"Many participants saw this drought as being particularly severe, probably reflecting its immediacy, but also the occurrence of unusual events (such as the desiccation of the normally perennially wet aguada on the Hobonil ranch). (...) This context probably affected respondents' perceptions of weather, with many people making comparisons against the 2016–2017 situation. Drought conditions were reported in all three communities. In San Felipe, it was compared with 2008 and 2010, but neither of these years appears in the top 10 driest years based on the meteorological site records (Online Resource 7). It seems likely that people were thinking of 2009, which SPI maps show to have been extremely dry across the YP. (...) Changes in the timing of rainfall through the year were noted; respondents from Calakmul suggested that there was less rain early in the season "now in June it doesn't rain, there is a lot of drought, it's like a movement of the earth how this has changed, this is what I have noticed" (March 6, 2017). (...) Participants from Tzucacab and Calakmul also referred to changes in the canícula (midsummer drought, mainly late July and August), which is not usually that pronounced in the YP. (...) A number of respondents even noted changes within a day "now it rains less in the morning …….in the past it rained in the morning as well, in the morning and in the evening, now it only rains in the evening and hardly at all in the morning" (March 14, 2017). (...) The impact of hurricanes, both positive and negative, was reported by community members. (...)Participants from all communities referred to traditional practices of weather forecasting and local ecological knowledge (observations of plants and animals) to track wet and dry years and the arrival of rain. A respondent at Hobonil noted that "when the ants are full of eggs, then rain is close, the same with tarantulas when they cover their holes it is going to rain and if not, then that's because there is a long drought" (March 18, 2017) and "when chachalacas [a chicken type bird] are singing this means that you will see rain" (March 18, 2017). Traditional weather forecasts are closely bound up with the concept of cabañuelas, where the weather during January provides a guide to the weather through the rest of the year. Community members from both Tzucacab and Calakmul referred to the traditional use of the cabañuelas as a guide of both how much land to plant and when. In San Felipe, something similar was done based on placing grains of salt (one for each month) into a box between 1st and 20th of January. Grains that remained intact signified drought. In Calakmul, the use of observations of the new moon to predict whether rain or drought was coming was also noted. Participants in Tzucacab described the ceremony of huajicol (making offerings to Maya deities) to ensure good rainfall and give thanks for a good harvest. In San Felipe, ranchers sometimes carried out a ceremony called Ch'a'Cháak, making offerings to the Maya rain god Chac, to ask for rain. This usually took place in June and July. It was reported, however, that the younger members of the communities had little interest or belief in these traditional practices and that in recent years, the forecasts from cabañuelas has become less reliable. One participant noted "in the past, yes, the cabañuelas worked, but not for about the last 30 years, the weather is changing and we are changing our planting times" (March 9, 2017)."

6	Perceptions and knowledge on climate change in local communities in the Offinso Municipality, Ghana	Sraku-Lartey, M.; Buor, D.; Adjei, P.O.-W.; Foli, E.G.	Information Development	2020	10.1177/0266666918811391	"Respondents were asked about what they perceived the term 'climate change' to be. Only 31.9% of the total number of 307 respondents had heard about the term or concept of 'climate change' while 68.1% of respondents had never heard of this term at all (Table 2). Among those who had heard of the term 'climate change', only 44.9% had heard about the term and really knew and understood what climate change was all about. The rest (55.1%) had heard of the term, but did not know what the term 'climate change' really meant. Further interrogation however revealed that some respondents had observed changes in climate; they did not however link these changes to the term 'climate change'. They were thus able to mention some indicators of climate change and their effects on their livelihoods. The researchers sought to find out where respondents had heard the concept of climate change from or their sources of knowledge. They were also asked to rank their sources of information according to the most common source. The most common source, and therefore the highest ranked, was the media (20.2%) which included radio, television and newspapers, followed by schools (6.8%), friends and family (3.9%), government sources (2.3%) and NGOs (2.3%) (Table 3). (...) Regardless of the fact that most respondents did not know what the concept of climate change was, all of them, nevertheless, were able to describe changes they had experienced in climate over the last 15 to 30 years. Those who had heard of climate change interpreted climate change in terms of low and irregular rainfall, (66.1%), high temperatures, (52.8%), prolonged dry season, (34.2%), strong winds, (7.2%) and excessive rain (3.3%) (Table 4). The most significant effect of climate change, according to respondents, was on their farming activities (91.2%). Other effects experienced by respondents was that climate changes 'Affects water supply' (73.3%) and 'non-availability of Non-Timber Forest Products '(NTFP) such as mushrooms, snails and firewood (42.0%). The final effect mentioned was that the changing climate creates conditions for forest fires (30%). The majority of respondents indicated that climate change and its effects were very important to them (54.4%) followed by 35.8% who ranked it as 'important' while 6.2% were neutral. Only 3.6% ranked climate change and its effects as 'not important'."
10	Perceptions of climate change and drivers of insect pest outbreaks in vegetable crops in limpopo province of South Africa	Phophi, M.M.; Mafongoya, P.; Lottering, S.	Climate	2020	10.3390/cli8020027	"About 84.4% of farmers were aware of climate change within the Vhembe District (Table 1). Within the irrigation system municipalities, the Thulamela and Makhado municipalities had the highest percentage of farmers who were aware of climate change. Within the dryland system municipalities, the Makhado municipality had the highest percentage of farmers who were aware of climate change within the district. (...) Within the dryland system municipalities, increased drought frequency and late rainfall were mentioned as main indicators of climate change by farmers (Table 2). Within the irrigation system municipalities, late rainfall and increased drought frequency were also mentioned as the major indicators of climate change. Farmers who mentioned none, are those who were not aware of climate change in the district."
6	Farmers' understanding of climate change in Nepal Himalayas: important determinants and implications for developing adaptation strategies	Paudel, B.; Zhang, Y.; Yan, J.; Rai, R.; Li, L.; Wu, X.; Chapagain, P.S.; Khanal, N.R.	Climatic Change	2020	10.1007/s10584-019-02607-2	"Temperature change was the most common indicator of climate change in Nepal, which was perceived by 99.2% of those surveyed. Other highly perceived indicators were rainfall (98.9%), climate_x0002_induced diseases and pests (96.8%), changes in vegetation species and diversity (96.0%), and drought frequency (80.2%). The $\chi 2$ (chi-square) test demonstrated that these were highly perceived indicators of climate change. A smaller proportion of respondents noticed changes in flood frequency (16.4%) or changes in crop types (20%) as indicators of climate change. Table 4 summarizes the indicators of climate change, as perceived by the surveyed farmers in different ecological regions of Nepal. Temperature change was the most highly perceived indicator in the Mountain region, while precipitation change was perceived more by the farmers of the Hill and Tarai regions. Drought events were commonly noted by the residents who live in the Mountain and Hill regions but were perceived slightly less in the Tarai region. Additionally, climate-induced diseases and pests were experienced more in the Tarai and Hill regions than in the Mountain region. Changes in vegetation were observed by a slightly higher number of the farmers of Tarai region compared with the Hill and Mountain regions. Flood events were observed more in the Hill and Tarai regions than in the Mountain region, and crop changes were noticed more in the Tarai and Mountain regions than in the Hill region. The farmers who were surveyed and participated in group discussions noted increasing temperatures and decreasing precipitation from 2004/05 to 2014/15. (...) The surveyed farmers' perceived adverse impacts of climate change in Nepal comprise five major sectors: adverse impact on staple crops (98.7%), adverse impact on human health (97.9%), adverse impact on vegetation (94.7%), adverse impact from disasters (particularly hailstorms) (90.4%), and an adverse impact on livestock (88.3%). (...)Farmers perceived that climate change had a significant impact on livestock and perceived that the frequency of climate-change-induced disease increased. (...) In addition, farmers noted that climate change has resulted in disasters, such as crop-damaging hailstorms, occurring more frequently than in previous decades. Over the past decade, farmers have perceived significant changes in climate, with the impact on crops being very negative."
6	Effects of a changing climate on livelihoods of forest dependent communities: Evidence from Buyangu community proximal to Kakamega tropical rain forest in Kenya	Saalu, F.N.; Oriaso, S.; Gyampoh, B.	International Journal of Climate Change Strategies and Manageme	2020	10.1108/IJCCSM-01-2018-0002	"In general, the majority of respondents were aware of climate variability and would explain their experiences using observable features, such as delayed rainfall, rising temperatures and prolonged drought spells over the past 20 years and more (Table III). Many respondents felt that rainfall patterns were uncertain, probably due to large interannual fluctuations in rainfall quantities over the years. (...) Simply, it can be deduced that farmers are cognizant of climate variability and its effects on livelihoods, especially on a short-term basis.(...) Based on the perspectives of farmers in Buyangu, Table IV displays a myriad of negative effects on crop production caused by climate variation. Feedback provided shows that there has been a high decline in common crop productivity over the past years with maize, sugarcane and vegetables being hardest hit."
10	Risk perceptions and adaptation strategies of smallholder farmers to climate change and variability in North Shoa Zone, Ethiopia	Tesfahun, A.A.; Chawla, A.S.	Management of Environmental Quality: An International Journal	2020	10.1108/MEQ-04-2019-0076	"In this regard, the vast majority of respondents (81.6 per cent) perceived changes in temperature and rainfall pattern over the past 20 years. (...) About 84 per cent of lowland and 81 per cent of midland respondents noticed an increase in temperature, whereas only a meagre of the study participants in both agro-ecological zones (1.9 per cent lowland and 4.7 per cent midland) farmers perceived no changes in temperature over the past two decades (see Figure 1). (...) Consistent with this, focus group discussants also confirmed that the temperature of the area, particularly the intensity, has been increasing so much over the last two decades. They also had the perception that an increase in the frequency of drought in the area is the direct consequences of climate change. Likewise, the vast majority of respondents claimed that the amount and pattern of rainfall had changed so much over the past two decades. Results of the survey revealed that about 74.8 per cent of lowland and 77.4 per cent of midland respondents perceived that the volume of rainfall has decreased and noticed a short rainy season, whereas a considerable proportion of the respondents (14.8 per cent of lowland and 19.8 per cent of midland) perceived an increase in the amount of rainfall. In line with this, 83.2 per cent of lowland and 84 per cent of midland farmers perceived that the length of the rainy season has decreased over the past two decades as shown in Figure 2. Agro-ecology-based comparison of the results of the survey depicted in Figure 2 shows that more respondents in the midland perceived a decrease in rainfall amount than in lowland. In addition, respondents mentioned that seasonal irregularities in the study area are causing inconvenience in their agricultural practice especially activities related to sowing and harvesting calendar. About 56.8 per cent lowland and 60.4 per cent midland farmers reported that they had noticed changes in rainfall pattern and amount, particularly changes in the timing of the rainy season and mentioned that the rainy season starts late and ceases early. This implies that farmers in the lowland areas are relatively less conscious compared to midland farmers as they are relatively exposed to longer dry spells, and the rainfall variability in the mid and high altitude is relatively more noticeable.On the other side, a considerable percentage of the respondents (15 per cent lowland and 32 per cent midland) reported that the rainfall pattern has become increasingly unpredictable as depicted in Figure 3. Consistent with this, FGD participants in the midland area stressed that over the past two decades they are unable to determine their cropping calendar due to the unpredictable nature of the rainy season. (...) The results of the study in this regard revealed that about 36 per cent of the respondents perceived that the long-term change in temperature and rainfall are caused by both natural process and human action, whereas 28 per cent of the respondents reported as it is dominantly caused by human action. However, a quarter of the respondents believed that the changes in climate were largely due to the wrath of God (Figure 4). Consistent with this, FGD participant farmers in the midland area mentioned that human being has little to do with the prevailing changes in climate."
2	Perception of the impact of climate change on the quality of life and well-being of the inhabitants of the cerro blanco agricultural community, Limarí province, Chile [Percepción del impacto del cambio climático sobre la calidad de vida y el bienestar de los habitantes de la comunidad agrícola cerro blanco, provincia de Limarí, Chile]	Alfaro, A.A.; Cortés, M.E.	Idesia	2020	10.4067/S0718-34292020000400127	"The grand majority of the interviewed inhabitants (n = 21; 95.45%) identified consequences of climate change on their health, quality of life and well-being, and in particular, effects on physical health (n = 8; 36.36%), psychological health (n = 5; 22.72%), educational and socioeconomic aspects (n = 7; 31.81%) and also on family distancing (n = 1, 4.55%) (Table 1). However, a minor proportion (n = 1; 4.55%) dismissed effects of climate change on their lives (Table 1). It is important to highlight that, when conduc_x0002_ting the interviews, the inhabitants spontaneously mentioned the association they found between the effects of climate change –degradation of the landscape, disappearance of flora and fauna and decrease of agricultural productivity– and the effects they perceived daily regarding their well-being and quality of life (mainly in terms of their income, health and mood)."

6	Small holder farmers' perception and response mechanisms to climate change: Lesson from Tekeze lowland goat and sorghum livelihood zone, Ethiopia	Mihiretu, A.; Okoyo, E.N.; Lemma, T.	Cogent Food and Agriculture	2020	10.1080/23311932.2020.1763647	"As a result, 86.5% of respondents aware of the existence of changes in main climate patterns while 92.3% of them also recognized variability in daily weather. The farmers also inquired about the patterns of temperature and rainfall across the study years. Therefore, 76.8 and 83.5% of them perceived an increasing temperature and decreasing rainfall, respectively in main rainy season (Table 1). This increasing temperature was confirmed by the FGD discussants opinion though they found tough to put the amount in number. (...) Based on the combined scale result, the respondents were agreed that frequent drought, shortage of rainfall, higher temperature, short and erratic rainy season to be the key climate change indicators. Deforestation, poor resource management, lack of soil and water conservation, pressure on nature and the population growth were identified as causes for climate change. (...) Similarly, nearly all respondents were experienced climate change caused disasters with varied degree of sway on their livelihood. Decline in crop produce, livestock and human diseases outbreak, declined in livestock productivity, recurrent wind storm, food insecurity and frequent conflict with the nearby communities for grazing land were farmers' notable effects perceived due to climate change."
16	Local trends in rain and temperatures and their perceptions by women from the surroundings of the Sete Cidades national park in Piauí, northeast of Brazil	Batista, W.F.M.; Sparacino, J.; de Espindola, G.M.; de Lucena, R.F.P.; de Barros, R.F.M.	Revista Brasileira de Geografia Fisica	2020	10.26848/rbgf.v13.3.p1035-1049	"Results obtained point to the fact that, in general, women have noticed climatic changes in the area surrounding the PNSC, both in relation to changes in the rainfall regime and in temperature (TABLE 1). (...) Regarding perceptions about changes in rainy seasons, the most frequent answer (85%) provided by the interviewees was "today it doesn't rain anymore like the old days". Regarding the amount (frequency) and intensity of the rains 70% of them affirm the rains are faster now and with less intensity. (...) As for the perceived changes in the duration of the rainy season, they are associated with its temporality, since they currently perceive a late onset of the rainy season and an early completion. The beginning of the rainy season "happened" in December for 83% of the interviewees, in contrast to what is perceived, currently, that it would be in January for 95% of them. (...) Also, 67% of women said the end of the rainy season, in the past, happened in June, as opposed to 86% who currently perceive the rainy season ending in May. (...) When asked about the rainiest month, the majority (92%) considered that the month of March was always the one with the highest volume of rains, although 5% considered that, in the past, the month that rained the most was February, and only 2% stated that the rainiest month was April. In FIGURE 4, it can be seen that March is actually the month with the highest rainfall in the region and that seasonality is very marked, with a concentration of rainfall occurring during the months of January to May, these rainfall data confirm the perception of women interviewed in the present study. (...) When asked about changes in temperature, more than 80% said they perceive a significant change, in which the majority affirm the climate is warmer."
6	Farmer's perception and adaptation strategies to changing climate in Kashmir Himalayas, India	Lone, F.A.; Maheen, M.; ul Shafiq, M.; Bhat, M.S.; Rather, J.A.	GeoJournal	2022	10.1007/s10708-020-10330-0	"The Fig. 3a summarises the results of the percentage of farmers indicating the seriousness of the climate change problem. About 63% of surveyed farmers in the Lidder valley reported that they are extremely worried about the climate change while around 28% indicated fairly worried (about 19%) to very worried (more than 9%). Only a small proportion of farmers reported that they are not worried at all (3%) or not very worried (5.64%). This is further supplemented by the fact that 87% of farmers have perceived climate change in the region and only a small fraction of around 13% are saying otherwise. (...) About 80% of farmers have reported decrease in snowfall in the studied period. (...) About 85% of the farmers have perceived an increase in both summer and winter temperatures and almost three-fourths of the surveyed farmers have reported an increase in the hailstorm events (Fig. 4). In the case of droughts and heat and cold spells, only half of the respondents have perceived an increase in their frequency. it is worthy to mention here that slightly more than 43% of sample farmers have reported an increase in rainfall while it is countered by around 38% farmers reporting otherwise. However, a few of the weather events often associated with climate change and variability such as cloud bursts, floods, lightning, and thunder are not perceived as more frequently by the majority of farmers. (...) Some farmers also have reported that all these weather events have remained unchanged over the last three decades but it is a case represented by a minority of respondents. (...) The majority of farmers in the Lidder valley reported that climate change is happening and affects all aspects of farming in the Lidder valley. The most weighted perception score among the local farmers was that they are more concerned about climate change (MPS: 4.485). Thereafter, the farmers expressed their concern due to climatic factors that it is affecting their farming in one way or another (MPS 4.69)".
27	Impact of climate change and variability on traditional farming systems: Farmers' perceptions from South-West, semi-arid Zimbabwe	Ndlovu, E.; Prinsloo, B.; le Roux, T.	Jamba: Journal of Disaster Risk Studies	2020	10.4102/JAMBA.V12I1.742	"In Matabeleland South, subsistence farmers had varying perceptions about climate change, as noted during the focus group discussions. Farmer A (aged 55), from Maninji Ward in Mangwe District, narrated climate change as reduced rainfall and high temperatures. He noted: 'The 2014/15 cropping season was the worst as I used to sleep outside the house at night because of the excessive heat wave due to very high temperatures. Our crops and livestock succumbed to the heat and moisture stress as a result of low rainfall and mid-season dry spells.' (Farmer A, 55 years, Maninji Ward, 2017). The implication of these observations by farmers was that climate change caused food insecurity, there was increasing food insecurity as a result of crop failure and the death of livestock. (...) In Matobo District, Farmer B viewed climate change as 'unpredictable changes in seasons and weather patterns' (aged 60, Malaba Ward, 2017). According to the farmers, the unpredictable weather patterns interfered with farmers' known planting calendars, as planting dates shifted. Such disturbances to the farming calendar contributed to reduced crop hectarage, resulting in food shortages because of delayed cropping or non-cropping. Farmers in Matobo and Mangwe districts opined that low precipitation and high temperatures would result in reduced productivity within traditional farming practices. (...) This was confirmed by the farmers, who mentioned that rainfall in the districts was erratic, unpredictable, poorly distributed, of low intensity and short-lived. Responses from the focus group discussions also pointed to delayed rains that would start around January, instead of starting in the month of October in the previous year, and ending around March instead of April. (...) Farmer C from Gwanda District noted that 'dramatic shift in the seasons over the past 20 years, protracted dry spells, periodic heat waves and flooding were now common' (aged 49, 2017). Across the three districts, the farmers spoke of frost and prolonged winter seasons as signs of climate change. Frost and prolonged winters impacted on late cropping and livestock production systems because livestock succumbed to the low temperatures. However, the farmers distanced themselves from contributing to climate change. Some farmers were of the view that the abandonment and neglect of their customs and belief systems and the adoption of 'foreign' religions were contributory factors to climate change. Through Focus Group Discussions (FGDs), the farmers noted that many communities no longer prayed for the rain at the rainmaking shrine in Matobo District, as they had converted to Christianity. The elder farmers felt that the conversion to Christianity violated their traditional cultural and religious practices; hence, they believed that God was angry with them, as evidenced by protracted droughts and other extreme weather events, such as floods and pests. Farmers in Mangwe and Gwanda mentioned that climate change and variability influence land degradation. Borrowing from their indigenous knowledge, farmers indicated that the disappearance of certain types of vegetation species such as mutopi and chithamuzi was an indicator of climate change. Farmers in Gwanda cited an increasing frequency of destructive tropical cyclones in the district, like Cyclone Eline in 2000 and Cyclone Dineo in 2017. From their perspective, tropical cyclones were now a common phenomenon, compared with some 20 years back. Some farmers blamed the village heads and traditional spiritual elders for failing to appease the ancestral spirits, who were said to be very angry with communities that had taken Christianity on board and shunned their traditional worship systems. The belief of the farmers was that embracing Christianity was the reason for the recurrence of droughts and related climate change manifestations, resulting in crop failure and increasing food insecurity. However, this claim was difficult to prove as it touches on spirituality and lack of climate information. They also blamed their spiritual elders for failing to facilitate rainmaking ceremonies and at the Njelele Shrine, in Matobo district, as was the practice by their forefathers, hence the protracted droughts and destructive cyclones. According to the farmers, their Mwali [God] in Njelele would provide rains at the most appropriate time, if communities paid their respects and appeased the gods annually, to avert climate threats. However, such perceptions by some farmers did not provide a strong basis for causing changes in climate and weather patterns. Communities in the three districts used the Sacred Mountain (Njelele) in Matobo as their spiritual worship centre and, therefore, shared some traditional beliefs. Matobo farmers added that the drying up of wetlands and the decay of certain animal and tree species, which included certain foliage for animals, was further evidence of climate change. Lack of knowledge of climate change and variability was found to be the reason for farmers hiding behind 'spiritual' connotations to explain their predicament – increasing food insecurity and poverty."
10	Impact of Climate Change and Adaptation Measures on Transhumance Herding System in Gatlang, Rasuwa	Rayamajhi, N.; Manandhar, B.	Air, Soil and Water Research	2020	10.1177/1178622120951173	"In Gatlang village, more than 66% of respondent have not heard about climate change while only 34% of people knew about climate change through radio. Perception on temperature variability. Most of respondents had opinion that temperature in summer now is increased (68.8%) followed by melting of snow is increased (50%) and number of dry days is increased (53.1%) except for temperature in winter is not changed (50%) (Table 1). Temperature in winter has mismatch perception by respondents. (...) Average winter rainfall, monsoon rainfalls were observed in decreasing trend which is 40.6% and 56.2%, respectively. Herders experienced increased erratic rainfall (53.1%) and unpredictable rainfall (62.5%). Similarly erratic events of snowfall (56.2%), thunderbolt (53.1%) events, and hailstorm (71.9%) were in increasing trend."

6	Farmers' perceptions of climate change and agricultural adaptation in Burkina Faso	Alvar-Beltrán, J.; Dao, A.; Marta, A.D.; Heureux, A.; Sanou, J.; Orlandini, S.	Atmosphere	2020	10.3390/ATMOS11080827	"On average, most of the farmers surveyed perceived a temperature increase in the last 10–20 years ($p < 0.05$, 92%), with a higher number of positive responses towards Sahel (95%) (Table 7). A similar pattern was reported for dry-spell duration, with almost 92% ($p < 0.05$) of the farmers across the country perceiving longer dry spells during the rainy season. In contrast, the perceptions on precipitation intensity di ered between agroclimatic zones. While Soudanian farmers perceived a decrease in precipitation intensity (60%), Soudano-Sahelian and Sahelian farmers were aware of increasing precipitation intensity (60% on average) over the last 10–20 years. Even though most of the farmers perceived an increase in rainfall variability, there were some discrepancies among Sahelian and Soudano-Sahelian farmers (with almost half of the farmers perceiving both an increase and a decrease) when compared to those living in the Soudanian zone (71% perceived an increase). In addition, there were significant differences ($p < 0.05$) between farmers observing a delayed and premature onset and o set of the rainy season (68% and 85%, respectively) with those acknowledging the opposite. Finally, farmers perceived similar changes in harmattan winds and dust storms along the different agroclimatic regions. Almost two-thirds (65%) of the farmers perceived an increase in the previous ($p < 0.05$), while the rest asserted a decrease or no changes both in frequency and intensity."
2	Farmers' perception of climate change and variability in the North-East District of Botswana	Bosekeng, L.C.; Mogotsi, K.; Bosekeng, G.	Livestock Research for Rural Development	2020		"Analysis of the data showed that farmers clearly perceive climate change. Respondents indicated that they had heard about climate change primarily through radio and television broadcasts as the main source of information, at 62.3 and 52.1% respectively. (...) The sustainability of agriculture as the main source of livelihood was perceived to be under threat due to detrimental long term changes in the mean rainfall and temperatures over the past 20 years (99.4% of the respondents). Ninety-two percent (92%) of the respondents perceived that it has become warmer. When asked about changes in rainfall, 96.4% of the respondents indicated that it has become drier because of late rainfalls, while 98.8% observed a shift in onset of rains from September to November and even December in some years. (...) The farmers also perceived that due to changes in rainfall and temperatures, there has been some changes in drought frequency, with droughts occurring more frequently (75.1%) and with increased intensity/severity (71.5%). Flooding was also observed in some areas by respondents though less frequently than droughts and less intense. (...) Eighty-nine percent (89%) of the respondents also noted changes in rangeland condition (Figure 3) over the years. Changes noticed included decline in herbaceous and soil cover as well as increase in deforestation in some areas, which are key indicators of rangeland degradation. (...) When asked about causes of climate change, most participants cited some social and cultural influences as having an impact on climate change. They reported that burning of fossil fuels in industries such as mining produces harmful gases (greenhouse effect) that makes the earth warmer. The increased use of automobiles was also perceived to generate harmful gases into the atmosphere. It was also reported that deforestation, probably because of economic benefits (e.g. selling of firewood) was a major contributor to land degradation leading to strong winds and soil erosion. Some participants cited neglect and abandonment of traditional culture and beliefs as also contributing to causing climate change. One farmer was quoted saying, " Farmers nowadays store seeds in plastic bags which is a taboo in our tradition as we used to store seeds in weaved traditional baskets, and this will cause the heavens not to open up for rains to come down on earth ". Another elderly respondent mentioned that " Nowadays some people just randomly cut down certain tree species such as Mokgalo (Ziziphus mucronata) which causes strong windstorms when cut ". Traditional practices such as praying to ancestors (Ngwale) asking for rains were said to be no longer practiced by many and therefore causing 'the Gods to be angry and not release rains'. Some farmers singled out modern developments such as the use of corrugated iron roofs, refrigerators, burning of refuse including old tyres as well as the use of electricity as contributing factors to increased atmospheric heat. Some even blamed the use of sophisticated scientific weather forecasting equipment such as satellites for causing climate change 'as scientists now believe they can also do what only God can do'. Whilst they may not always know the science or reasoning behind the changes perceived, most farmers surveyed demonstrated generally good understanding of their semi-arid environment, relying on indigenous knowledge accumulated over generations. (...) The farmers through Focus Group Discussions (FGDs) reported that over the years in question, they have experienced delayed rainfalls, loss of biodiversity, strong winds, high temperatures and seasonal variability. These were cited as indicators of climate change."
10	"Are they aware, and why?" Bayesian analysis of predictors of smallholder farmers' awareness of climate change and its risks to agriculture	Ng'ombe, J.N.; Tembo, M.C.; Masasi, B.	Agronomy	2020	10.3390/agronomy10030376	"Descriptive statistics in Table A2 show that the average climate change awareness across districts ranges from 54% to 91%, which indicates variation in climate change awareness among farmers by district. For the whole country, descriptive results suggest the mean value of awareness of climate change and its risk to agriculture among smallholder farmers in Zambia is 77%. These findings clearly suggest a high number of agricultural producers in Zambia in the sample are aware of climate change and the risk it poses on agricultural production. "
1	Farmers' perceptions and matching climate records jointly explain adaptation responses in four communities around Lake Tana, Ethiopia	Darabant, A.; Habermann, B.; Sisay, K.; Thurnher, C.; Worku, Y.; Damtew, S.; Lindtner, M.; Burrell, L.; Abiyu, A.	Climatic Change	2020	10.1007/s10584-020-02889-x	"Farmers' definitions of climate change were succinctly summarized by a member of the male PARIC in Askuna Abo: "For me climate change is the change in rainfall, temperature and wind condition". Besides changes in climate parameters, farmers frequently used impacts to define climate change. "In general, a weather condition which is not suitable for human, animal and plant welfare can be considered as climate change", stated a female PARIC member in Gelawdiwos. Agreement on widespread deforestation as the main cause of climate change was unanimous across PARICs: "We have unknowingly and severely destroyed forests and as a result we see that climate is changing." (Askuna Abo male FGD). Farmers in all four communities perceived changes in different climate parameters over the past 30 years. However, perceptions differed considerably between communities and gender groups. The increased variability of precipitation, increased drought, followed by higher temperatures and stronger wind were listed as the most important aspects. In terms of precipitation, PARICs reported late and increasingly variable onset of monsoon, intermittent dry periods, early cessation of rains, unwanted rain in the harvest season between November and December, increased frequency of hail and high inter-annual variation. While females rather perceived precipitation extremes, males noted increased variability of precipitation within a season (Table 1). Farmers on average reported a shortening of the duration of the rainy season from 7 months 30 years ago to 3 to 4 months at present, an observation which to a large extent was backed by climate records (Fig. 2). (...) While the decrease in annual precipitation (Fig. S1) was perceived by farmers, they did not assign any priority to this phenomenon (Table 1). Apart from males in Gelawdiwos, all other PARICs reported a marked rise in temperature over the past 30 years (Table 1)—mostly with increased rate of change since 2000 to 2005—and assigned intermediate importance to this climate parameter. (...) All communities lamented a rise in wind occurrence and speed (Table 1), occasionally with an increased rate of change since 2000 to 2006. In two communities, increased wind was considered more important as compared with temperature rise. The recent improvement in wind conditions in Askuna Abo was attributed to successful forest restoration efforts. An increase in the occurrence of extremes of single climate components (precipitation, temperature, and wind), as well as multivariate climate components (flood and drought), was reported by PARICs (Table 1). Torrential rainfall was of particularly high importance due to its direct impact on agriculture. Drought as the most important climate extreme was reported, highlighting its severe consequences: "There was drought from 2005-9 for five years. During that time, we did not have enough … to feed the whole family" (Tara Gedam male PARIC)."
1	Climate change, risk perception, and protection motivation among high-altitude residents of the Mt. Everest region in Nepal	Poudyal, N.C.; Joshi, O.; Hodges, D.G.; Bhandari, H.; Bhattarai, P.	Ambio	2020	10.1007/s13280-020-01369-x	"When asked about changes in various measures of climatic conditions, the vast majority (more than 70%) reported witnessing increases in temperature and drought in the Khumbu region (Fig. 1). More than three-quarters of respondents noticed decreases in both the intensity and frequency of snowfall and increases in temperature and drought. (...) In addition, slightly more than half (55%) of the respondents in this study indicated that the frequency as well as intensity of rainfall had declined over the years.(...) Slightly less than one-third indicated having seen an increase in windy days. (...) More than three-quarters (76%) asserted that there were more extreme weather events recently, whereas only 35% agreed that talks of changing weather patterns are exaggerated (Fig. 2). Over 80% agreed that weather conditions in the region have been less reliable over the years and will continue being so in future. More than half (58%) reported that changing weather patterns are already hurting their farms and pastures. As the land stability and floods are major issues in the mountainous regions, 68% indicated that changing weather conditions would lead to more floods and landslides. (...) In response to the question concerning climate-related information, most respondents (82%) indicated that their primary source is media such as radio and TV (Fig. 3). Slightly less than half (47%) indicated having learned about climate change from their own experience, and about one-third (33%) indicated having learned from friends and neighbors. Some also mentioned having heard about climate change from school teachers (17%) and tourists (15%). Very few (less than 10%) mentioned having received information from NGO, project, or government staff."

1	Variability and change of climate extremes from indigenous herder knowledge and at meteorological stations across central Mongolia	Tumenjargal, S.; Fassnacht, S.R.; Venable, N.B.H.; Kingston, A.P.; Fernandez-Gimenez, M.E.; Batbuyan, B.; Laituri, M.J.; Kappas, M.; Adyabadam, G.	Frontiers Of Earth Science	2020	10.1007/s11707-019-0812-6	"Local herders in both Ikh-Tamir and Jinst soums described the basic processes of climate changes based on their experiences and observations with nomadic herding practices. The herders stated that their environment has become more challenging due to frequent extreme or harsh weather events. All herders in both soums stated that drought and windstorms were occurring more often with droughts lasting longer. Almost all (80% to 95%) herders also stated that extreme winter storms (dzud) and sandstorms were occurring more often, with dzud lasting longer. In conversation, herders commented that extreme hot and cold days were occurring more often, with the narratives suggesting an increase in the number of hot summer days, cold summer nights, and warm winter days and nights. Many herders reported that the average temperature had increased in recent years. This warming temperature was observed to be greater in the cool season with February and April warming the most, followed by July (Similar results to Fig. 4(a)). Herders have been adapting to this warmer weather during the last 10 to 20 years. One herder in Jinst said that "in the 1970s, I never observed snowmelt in winter. But in the past few decades, I have observed snowmelt earlier in winter occasionally due to higher temperatures; this is an unusual and unseasonal phenomenon." An Ikh-Tamir respondent also reported that "in the 1970s, the winters were very cold with lower temperatures reached minus 40 degree Celsius and we used fur coats, felt boots and sheep skin hat at that time. Due to rising temperature we had not used any of these warm clothes since the 1990s." One female elder added that they kept their warm clothes in small house at the soum center or in winter shelters and did not need to use them. (...) From the quantitative survey, 80% of Ikh-Tamir herders and 65% of Jinst herders observed more intense rain, which was observed with low infiltration. For example, Ikh-Tamir herders stated that, "In the past few years, short and intense rainfall has occurred which produced high runoff and did not saturate the soil moisture. Previously, rainfall duration was longer with soft rain and it's enough to saturate soil moisture and affect good quality grass growing." Herders in Ikh-Tamir also reported that "20 years ago, we had a long duration of rain which lasted 3 or 4 days and we did not have any dry clothes (deel traditional clothing) to wear and hardly found dry trees to make fire for cooking at that time." One herder in Jinst said that "in the summer of 2009, rainfall occurred only in May and less rain than previous which caused prolonged drought during the summer and animal did not gain enough weight." Many of herders said that "generally, summers were very dry here (with) hardly any rain in recent years."""
1	Climate variability and rural livelihood sustainability: evidence from communities along the Black Volta River in Ghana	Yiridomoh, G.Y.; Sullo, C.; Bonye, S.Z.	Geojournal	2020	10.1007/s10708-020-10144-0	"From Table 1, 48% of the respondents reported that rainfall over the past one decade has been short while 30% of the respondents observed that rainfall over the last one decade has been unstable. Also, 22% of the farmers reported that drought in between the rains was highest which implies that drought in between the rains (drought spelt) was rampant. According to the people, the rainfall pattern had changed totally over the past 10 years where one could rely on for the production of food crops and other rain-dependent livelihood activities. This change according to the respondents has made it very difficult for people who are into agriculture to get good yield as captured by one of the household heads: "Rainfall these days is not like in the past…. in the past, rain was quite stable and one could determine the start or end of it, varying climate has influenced the stability of it. Today, it becomes difficult to tell whether or not it will rain today or tomorrow or in the future". The sporadic nature of rainfall brings untold hardship to community members as most of them expressed dissatisfaction to current unpredictable, and unstable nature of rainfall currently experienced. When respondents were asked if they experienced changes in their temperature over the last decade, 56% of the respondents as represented by Table 2 reported that the weather was always warmer than before while 12% of the respondent observed that the weather was always cold. Also, 25% of the respondents noted that extreme weather conditions was experienced while 5% of the respondents observed no changes to temperature extremes. In the interview section with respondents, household heads reported that temperature of late is always too high with much implications on their lives. They particularly observed that weather becomes warm in the early hours of the day which they did not experience in the past three decades. Respondents observed that lack of rainfall is the resultant effect of warm temperatures which we experience every day. Respondents noted the effect of warm weather to their livelihood to include drying up of food crops and water bodies. For instance, one of the respondents noted that: "Over the past five years, our weather is always too warm for us…maybe, because we do not experience rainfall as we used to. We are really in hard times as most of our livelihood are depended on the favorable weather conditions". (...) Respondents indicated that they rely on their own knowledge (indigenous knowledge), what was done in the past that worked for them or coming out with new ideas when the old ones become redundant to help them adjust to the yearly variation of the climate system."
3	Place-based perceptions, resilience and adaptation to climate change by smallholder farmers in rural South Africa.	Tesfuhuney, W. A.; Mbeletshie, E. H.	International Journal of Agricultural Research, Innovation and Technology	2020	10.3329/ijarit.v10i2.51585	"Data from the survey indicate that all interviewed farmers were aware of temperature changes in the region within the last 5 years. However, not all the farmers agreed as to the direction the temperatures were going. The majority of respondents (69%) perceive temperatures to have cooled down than warming up. (...) Results on precipitation indicate that again all the respondents perceive a change in rainfall patterns in the last 5 years. A greater percentage (86%) perceives that the district is becoming drier than it was 5 years ago. These perceptions seem to be supported by the observed shifts from cereal production to animal husbandry and drought-tolerant crops. Overall, 100% of the respondents feel that the weather, in general, is changing with 91% attributing these changes to climate change. Farmers' awareness of these global environmental events can be attributed to the high literacy levels of farmers in the district together with access to media. Results in Table 1, show that all respondents said they had witnessed drought events in their district with an average of 3.2 events affecting the area. High temperatures and late rainfalls were the other events identified by 83% and 82% of the farmers, respectively. (...) Snowfall has been observed by 77% of the respondents with an average frequency of 2.9. Inconsistent rainfall and rainfall ending earlier than normal were observed by 74% and 60% for the respondents, respectively. Farmers were further asked to identify what they perceived as the causes of these weather events they had observed in their region. Their numerous responses were categorized into a few themes for easy analysis and the results are presented in (Table 1). The majority of farmers attributed the occurrence of these events to climate change, although the other themes had low responses, these themes cannot be completely dissociated with climate change. The results indicate an increasing awareness of climate change by smallholders and how it is affecting the livelihood.(...) The results in Table 2 present the findings from the survey concerning farmers' perceptions of the effects of climate change. An above-average of respondents indicated that the occurrence of extreme weather events has effects on agricultural production. Above 50% of the farmers indicated that agriculture was being affected a lot in terms of yield loss, animal death, reduced quality of produce, disease prevalence and frequency of pest outbreaks. A proportion of 51% of the farmers in the district perceives climate change as a purely natural phenomenon (Table 2). These natural causes include natural changes in winters, low/high temperatures, changes in precipitation and changes in wind movement, among others. There is a greater tendency to disregard human influences as indicated only by a meager 17% of the respondents. From the respondents, 25% attributed global warming to increasing climate variability, a response that can be linked to a lack of understanding of the connections between anthropogenic effects and global warming. (...) Farmers were also asked to highlight the environmental impacts of climate change, especially on their livelihoods. Results in Table 2 show that about 40% of the farmers believe climate change is causing a decline in on-farm production. About 20% of the farmers indicated that it was affecting the quality of their crop and livestock production. Land degradation and increasing costs of production were mentioned by 15% of the respondents. A smaller proportion, less than 10%, of the farmers mentioned the death of livestock and an increase in pests and diseases as some of the effects of climate change."
3	Trends in climate variables (Temperature and rainfall) and local perceptions of climate change in Lamu, Kenya.	Yvonne, M.; Ouma, G.; Olago, D.; Opondo, M.	Geography, Environment, Sustainability	2020	10.24057/2071-9388-2020-24	"Majority of the respondents (96%) reported having observed changes in temperature over the last ten years (2006 to 2016). Out of those who observed changes, 60.2% reported that temperatures have risen, 17.3% observed that it has become cooler over the same time and 22.5% reported that even though temperatures have changed in Lamu County, they could not quantify the change. The respondents who observed that temperatures have risen include farmers, watchmen fishermen/women and pastoralists. The data was disaggregated by livelihood to see if certain livelihoods were more sensitive to changes in temperature than others. Of all the livelihoods sampled, a higher percentage of fishermen/women, farmers and pastoralists (over 70%) noted a rise in temperature as compared to the unemployed and general office workers. Nearly all of the respondents (96%) reported having observed changes in the amount of annual rainfall in the last ten years (2006–2016). Out of the respondents who observed changes in rainfall, 89.4% were of the opinion that rainfall had reduced during this period while 5.9% opined that rainfall had increased over the same duration. Whereas, the remaining 4.7% who observed changes in rainfall could not say whether rainfall had increased or reduced. Similarly, the changes observed in rainfall were examined by livelihood to see if certain livelihoods were more perceptive to changes in rainfall than others. The study showed that on average, a large majority 95.2% of the respondents who noted changes in rainfall were from rainfall dependent sectors – this included miners, fishermen, pastoralists, farmers, ranchers and mangrove harvesters. In addition, more than half (54.5%) of the respondents noted that the amount of rainfall received over the years was insufficient to meet their required water needs. Further, they stated that the rains they received during the rainy season did not provide enough water to last them until the next season."
3	Smallholder Farmers' Perception and Their Adaptation Strategies to Climate Variability and Change in Ale and Bure Districts of Ilubabor Zone, Southwest Ethiopia	Tadesse, S.; Madduri, V.	International Journal of Sciences: Basic and Applied Research (IJSBAR)	2020		"Results from the farmers' perceptions regarding changes in the climatic variables are presented in (Table 2). Majority of the respondents in this area are experiencing irregularities in the climate as they have been farming there for many years. Findings from household survey indicated that the amount of rainfall in the study areas has generally decreased during the last 34 years as reflected by a large proportion (88.8%) of respondents (Table 2). This result further supported by FGDs and key informants interview as they reported rainfall had become highly variable and more erratic. Similarly, a considerable number of the respondents (94.2%) in the study districts were received temperature was increased over the past 35 year periods.(...) With regard to frequency of drought, 83.1% of the respondents stated that they had observed frequency of drought over the last decades. Findings from key informant interviews and focus group discussions confirmed that there are widely held perceptions of increased frequency of drought and decreased number of rainy days along with other local environmental changes. Furthermore, they identified personal observation, radio and television as the most frequently available sources of information for farmers in this study area.(...) The survey results also showed that farmers perceived the climate change in the past 34 years. In general, most of the farmers felt that temperature had increased over the past two and half decades."

3	Indigenous knowledge in climate change adaptation: Case studies of ethnic minorities in the Northern Mountain Region of Vietnam.	Kieu, T. T. H.; Nguyen, T. N.; Nguyen, T. H. T.; Vu, T. H. A.; Nguyen, Q. T.	Journal of Vietnamese Environment	2020		"By interviewing local people, considerable differences in the quantity of rainfall and temperature were found; these has caused many natural hazards such as flooding, landslides, and drought. The data in the Table 1 shows that most respondents agree that the amount of rain is increasing and changing in irregular ways; it is the same with the case of temperature. A 26% of the respondents in the Tay minority agreed that the amount of rain and temperature is increasing. It is 22% and 23% in the Dao and Hmong communities respectively; in average, 76% of the respondents indicated that nowadays the amount of rain and temperature are very irregular. In May, the temperature tends to be higher while rainfall is at its lowest; this causes drought and negatively affects the farmers' agriculture practices. The irregular rainfall and temperature cause many natural hazards such as flash flooding, storms, drought, frost, and harsher winters. Focus group discussions with Tay people in Nam Mau commune (Ba Be district, Bac Kan province) revealed that in 2018, there were about 15 flash flooding events and three drought periods in the area. The Dao people in Khai Trung (Luc yen, Yen Bai) reported four extreme cold events, eight extreme hot events and 30 massive rainfall events in their community. The Hmong minority in Long He (Thuan Chau, Son La) indicated that their villages are recently more affected by drought and landslides in summer than during extreme cold and frost in winter."
3	Smallholder Farmers' Perception of Climate Change: The Case of Jamma District of South Wollo Zone, Ethiopia	Tadesse, S.	Developing Country Studies	2020	10.7176/DCS10-9-04	"Among the sampled respondents, 94.2 percent perceived long-term changes in temperature in the study area over the years. Out of which, 92.3 percent perceived as an increase in temperature and only 1.9 percent of sampled households perceived a decrease in temperature whereas, 5.8 percent of sample households perceived as constant. Similarly, 91.7 percent of sampled households perceived an increase in a number of hot days while 3.2 percent of respondents perceived as it is decreasing and only 5.1 percent of respondents were perceived as constant over the past two decades (Table 1).(...) The result showed that 98.2 percent of the sampled households perceived that the Belg rain was decreased. Correspondingly, 90.4 percent of the sampled households have perceived that there was a decrease in the overall average rainfall in the main rain season (kiremt) (Table 2).(...) The survey result showed that 92.3 percent of the sample household perceived temperature has increased and 88.5 percent perceived a decrease in the amount of rainfall. Likewise, 91.7 percent of the sampled households perceive an increase in a number of hot days per year while 99.4 percent and 96.1 percent of sampled households perceived late start of rainfall and early cessation respectively over the past two decades (Table 3). The survey result also showed 49.4 percent and 20.5 percent of the sample households perceived a high increase in temperature and a high decrease in the amount of rainfall over the past two decades respectively. Moreover, only 1.9 percent of the sample households indicated that temperature has been decreasing and 1.3 percent of households perceive the rainfall has been increasing. Similarly, about 5.8 percent and 8.3 percent of the sample households perceived no change in temperature and rainfall, respectively (Table 3). About 91.7 percent and 92.3 percent of the sample respondents indicated that late start of precipitation and early cessation of precipitation with the highest level respectively. Similarly, the amount of rainfall in the Belg season decreased by 91.7 percent. The mean value of the Likert score for the above climate change parameters is 4.4, 4.1, 4.91 and 4.85 for temperature increased, precipitation decreased, late start of precipitation and early cessation of rainfall, respectively. These results indicated that rainfall had changed with the highest variability in starting late and early cessation over the past two decades followed by temperature (Table 3).(...) All of the respondents well recognize the climate induced shocks especially the aged farmers remember the severe drought year in Ethiopia. Moreover, the young farmers also remember the recent drought year 2015/16. Therefore, the main climate related hazards and their level of severity in the study area is summarized in the following table (Table 4). The surveyed households were asked about their perceived impact of the above environmental shocks. The sample respondents observed many consequences of climate induced shocks which affect their livelihood. However, the effects of these shocks are different in different agro-ecological location. Majority of them are a shortage of water, decline in crop yield of the farmer, death of livestock and human health problem (Table 5). The respondents indicated that there is frequent occurrence of drought in the study area. This climate induced shocks severely affect both their crop and animal production. They also indicated an increase in crop pest and animal disease in the study area over the past two decades. They also suggest a new crop pest and disease occurred in the study area. It affects mainly teff, sorgum and beans. During focus group discussion, farmers said that their number of animals are gradually decreasing due to poor feeding and animal disease. The grazing land is reduced from time to time due to expansion in agricultural land and house construction. (...) Another climate induced shock encountered by the farmers in the study area is a shortage of water."
3	Smallholder farmers' perception and adaptation strategies to climate change and variability in Ankesha Guagusa District of Awi Zone, North Western Ethiopia.	Kebede, A.	Journal of Economics and Sustainable Development;	2020	10.7176/JESD/11-1-05	"83% of respondents perceived increase in temperature, 6% of respondents perceived that temperature was declining and 11% of the respondents perceived no change in temperature. In terms of rainfall, 79% of the respondents perceived a decrease in the amount of seasonal rainfall1, 5% of the respondents perceived increase in the amount of seasonal rainfall and 16% noticed no change in the amount of rainfall. Respondents told that, the frequency of drought and flood are increasing, a general delay in onset of rains and the rainfall distribution pattern is becoming unpredictable. (...) Regarding the impacts of climate change and variability, the frequently experienced climatic shocks identified by the respondents that have a significant impact on crop production are prolonged drought including late on set/early off set of rain, flood, frost and unseasonal rainfall. From the annual crop data analysis, there was a frequent decline of crop production in the district from 2002-2009. The respondents listed a number of reasons for this production decline. Out of the total 68% of the respondents said climate variability, 31% declining soil fertility, 15% lack of input and 7% crop pest found to be the major reasons for yield reduction (Figure 2)."
6	Perceptions and practices of climate change adaptation and mitigation strategies among farmers in the Konta Special District, Ethiopia	Abera, N.; Tesema, D.	Environmental and Socio-Economic Studies	2019	10.2478/environ-2019-0019	"As indicated in Table 3, most (97.6%) of the surveyed farmers perceived that the climate is changing in their locality. When comparing the situation with the recent past, the majority of the respondents (69%) also perceived that climate was changing drastically. This point was supported by FGD participants who unanimously asserted that the change in climate is accelerating faster than ever. Respondents identified different indicators signifying climate change. Key informants mentioned that inter-generational climate variability is huge and significant. Participants identified change in rainfall pattern, increase in temperature, climatic zone change and consequent change in patterns of agricultural activities as manifestations of climate change. Respondents indicated not only a change in climate but also mentioned that the change is significant. An elder (Age 62) said, "We are witnessing a green desert" indicating that temperature is increasing despite the vegetation cover in the area. Substantiating this assertion, 69% of survey respondents indicated that the pace of climate change is significant. As indicated in Table 4, a substantial percentage of respondents (97%) perceived the change of climate in terms of erratic rainfall distribution; while 96.3% of the respondents identified climate change by increasing temperature. Some 82.8% of the respondents perceived that climatic zone and consequent agricultural activities were due to changes in climate. A male FGD participant (Age 47) from Mareka Godi kebele echoed this perception and articulated it as: Climate is changing at a higher pace in our area. Before some ten years, we were more or less certain about the seasonal characteristics. We used to know what happens during the autumn; the winter, summer, and spring. Accordingly, we allocate our resources to make a living. However, nowadays, unexpected events are emerging and thus we are not certain about seasons. The vagaries of change in climate has affected the cropping calendar and labour allocation among farming communities the majority of which pursue rain-fed agriculture. (...) FGD participants reported the ever-increasing temperature and associated occurrences of diseases such as malaria, maize fall armyworms, wheat rusts, expansion of the ecological niche of annual crops such as teff, haricot bean. According to the Konta district rural development expert, these crops were commonly identified with lowland agro ecology some ten years ago. In the past, crops grown in different agro-ecology were easily identified. Nowadays crops grown across agro-ecological conditions are changing due to climate change. Crops, which used to be grown only in lowland areas such as teff are also becoming common in the midland. Due to unpredictable climatic condition, participants were also reported to change their closing style frequently between warm and cold weather conditions, which become unusually, occur one after the other. (...) As shown in Table 5, almost all (97.3 %) of the respondents believe climate change is exacerbating the vulnerability of the livelihoods of rural people. Hence, an increasing intensity of floods and landslides, drying of rivers and streams, the manifestations of new diseases and pests and recurrent drought were among the major threats of climate change mentioned by the respondents. (...) Key informants from the district environmental protection office mentioned that the study area is increasingly facing floods and landslides. Of the total sample, 82.8% perceived that frequent floods and landslides occurred in the area due to climate change; 77% of the respondents mentioned the drying of rivers and streams; 95% stated manifestations of new animal, human and plant diseases and pests, while 57.4% of the respondents witnessed recurrent droughts occurring in the last ten years due to climate change. (...) However, respondents unanimously asserted the occurrence of climate change, their arguments for the possible causes of the changing climate is not uniform. Fig. 1 presents the causes of climate change perceived by respondents. Accordingly, a substantial number (35.8%) of respondents considered climate change to be a curse from God or suffering from sin. Informants emphasized that the bad doings of the community were because nature was retaliating. About 27% of the respondents perceived that human beings were mostly responsible for the changing climatic conditions. Moreover, 26% and 11% of the respondents perceived that both human activities and natural changes were responsible for climate change respectively. In recognition of the above data, most people in the study area considered climate change as the wrath of God or punishment for peoples' wrongdoings and human activity. (...) Regarding attributing climate change to God, FGD participants from Mareka Godi kebele loudly stated: 'Climate change is an act of God. The change of climate we are suffering is the Wrath of God which is due to our exploitative use of natural resources'. However, such perceptions are not part of the scientific explanations of the causes of climate change. On the other hand, Rural development experts and agricultural extension workers asserted that the understanding of climate change as a function of anthropogenic factors is growing. (...) Other participants held the view that climate change is induced by anthropogenic factors. With reference to deforestation, one participant from Konta Koysha stated that: '… the mistake is ours; we human beings exploited our environment especially the natural forests without any limit. All of us want to maximize our benefit at the expense of the environmental gift'. In general, climate change is widely perceived to be a reality by different groups; various mixed causes were indicated some of which were different from the scientific explanation."

29	Comparing smallholder farmers' climate change perception with climate data: the case of Adansi North District of Ghana	Asare-Nuamah, P.; Botchway, E.	Heliyon	2019	10.1016/j.heliyon.2019.e03065	"In all, about 90.5% and 87.8% of the farmers perceived that there have been changes in the pattern and season of rainfall, respectively in the district over the past 30 years. In the case of temperature, a vast majority of the respondents (80.7%) perceived that there have been changes in temperature in the district. Similarly, there have been changes in windstorm in the district as reported by 83.1% of the respondents. (...) However, smallholder farmers revealed during the interviews that the changes in windstorm equally requires attention, as windstorm goes beyond just the destruction of agriculture to livelihood assets and resources such as buildings and roofing. (...) The majority of the farmers have experienced late onset and early cessation of rainfall in the district as reported by 82.8% and 89.2% of respondents, respectively. (...) A vast majority of the smallholder farmers (94.7%) have also experienced decrease in the duration of rainfall while about 82.5% of the farmers have observed an increase in rainfall intensity. (...) In consonance with previous studies in Ghana (Limantol et al., 2016; Ndamani and Watanabe, 2015), the majority of the smallholder farmers indicated that they have observed an increase in intensity (96.8%) and duration (94.7%) of temperature in the district over the past 30 years. While about 79.4% of the smallholder farmers have experienced an increase in intensity of windstorm, 76.7% of them have observed a decrease in windstorm frequency. (...) Almost all interview participants agreed that there has been an increase in temperature in recent times. Both officers and household heads concluded that temperature in the district has increased compared to what they knew in the past 30 years. (...) The interviewees also revealed that there have been changes in onset, cessation, intensity, frequency and duration of rainfall. (...) The majority of participants raised concerns on unpredictability of rainfall due to climate change.
10	The link between smallholders' perception of climatic changes and adaptation in Tanzania	Brüssow, K.; Gornott, C.; Faße, A.; Grote, U.	Climatic Change	2019	10.1007/s10584-019-02581-9	"Almost all farmers included in the sample had perceived climatic changes in some form over the last 20 years (97%). With regard to precipitation, more than half of the farmers reported experiencing lower annual precipitation volumes (46%) or fewer rainy days (14%) in total over the year (Table 2). Approximately 15.8% of the farmers stated that the rainy season had grown shorter. Approximately 10% of the farmers reported a change in early rainy season patterns. Major changes with regard to temperature were also perceived by the farmers (Table 3). Most of the farmers had perceived more extreme temperatures (38%), more heat days (26%), and hotter summers (22%). In both regions, many farmers report being affected by more crop failures (53%) and by lower yields (60%). More frequent flooding was reported by half of the households in semihumid Morogoro, whereas only 7 farmers in Dodoma reported being affected in this way. Approximately 54% of farmers in the Dodoma Region felt affected by more frequent drought events whereas in Morogoro, the share is only 13%. Very few farmers described not being affected by climatic changes in their agricultural activities, which is not surprising given the sample mainly includes subsistence farmers "
6	Pastoral yak rearing system is changing with change in climate: an exploration of North Sikkimin Eastern Himalaya	Feroze, S.M.; Ray, L.I.P.; Singh, K.J.; Singh, R.	Climatic Change	2019	10.1007/s10584-019-02551-1	"The respondent yak herders too perceived that the temperature both in winter and summer has risen in comparison to last decade but they were unable to report much difference in amount of rainfall in the region. Hence, herders' perception and analysis of climatic data were in synchronization. The nomadic herders experienced increase in summer temperature and decrease in snowfall which is inconsonant with the finding of Sharma and Rai (2012) in this hilly terrain. They reported that about 15 years back, Lachen used to experience heavy snowfall upto 4–5 ft but nowadays, the snowfall is only about 1–2 ft in Lachen and about 2–3 ft in Yaksee which is 20 km farther from Lachung. They informed that the lower altitudes which earlier used to receive snow sometimes no longer receives snowfall."
10	Using traditional ecological knowledge to understand and adapt to climate and biodiversity change on the Pacific coast of North America	Wyllie de Echeverria, V.R.; Thornton, T.F.	Ambio	2019	10.1007/s13280-019-01218-6	"Almost every interviewee agreed that weather patterns had changed during their lifetimes (Table 1). Most commonly, the heavy snows and cold temperatures that used to occur every year, sometimes yielding accumulations up to the eves of houses, are gone; now there is hardly any snow or frozen water. However, there were differing opinions on the intensity and duration of change, and on how much these changes affected resource distribution, harvesting, and processing. While not everyone could place a timescale on changes in weather patterns, those that did comment on shifting patterns observed that the changes had occurred either in the last 8–20 years, or about 30–40 years ago. Research participants also differed in how they characterized climate rates of change with some describing a pattern of gradual changes, such that they had hardly noticed it until they compared today's that of their childhood, while others suggested that changes in had accelerated in more recent years. Elders especially felt that in the early period of their lifetimes (50–70 years ago), weather was more predictable and stable, and this was noted throughout the whole study area. Since people scattered in various communities noted the above observations, a geographical pattern was not determined, and thus these differing perceptions may be due to the range of microclimates experienced across the Pacific Northwest region, and more how different places are exposed to different winds and temperatures on such local geographic factors as exposure and sheltering patterns, rather than latitude. (...). For example, there were differences between the Alaskan (Northern and Southern Southeast) and British Columbian (Haida Gwaii and Mainland British Columbia) communities with regard to observing sea-level rise vs isostatic rebound. Other changes to observed weather patterns that participants commented on included that the timings of the seasons had shifted, and that there was less definition between the seasons. Research participants observing 'seasonal shifts' were referring to the fact that weather typically considered autumnal, like major rainstorms, and associated floral and faunal behaviours, were occurring earlier in the year than before. (...) For example, AB (Old Massett) commented on the shifting of spring into summer: "it's not so pronounced now…one kind melts into the other, without…any visible change." Similarly, EHA (Hoonah) observed that the seasons were becoming less defined, especially with the decline of snow in winter. "We had a lot more snow, we had our very definite 4 seasons, very defined…and our 4 seasons aren't even defined the way they used to be, I mean, we even have…in our beadwork, my auntie Jess Grey…[did] the '4 season flowers' [traditional pattern reflecting the distinct seasons]… and it [is] not as defined anymore…like one winter we had nothing but rain, it was just brown all winter; we didn't get any snow". While these observations cannot be easily quantified, research participants made comments about spring weather feeling more 'winter-like,' the end of summer being autumnal, and autumn blending in with winter weather patterns. Since the weather patterns of each season affects how plant resources develop and ripen, and when animal species are ready to harvest, it was noted that the timing of harvesting had changed accordingly. (...) For example, uncertainty in accurately predicting both seasonal weather patterns with regard to dangerous weather (an access issue), and the timing and stage of ripening/maturation (a harvesting issue) have led to participants describing having difficulty judging the best and safest time to harvest. Several participants mentioned that they do not always know when to harvest anymore, as the timings are different from a generation ago, so they must expend additional time, energy, and fuel checking the status of the resources for harvest. (...) AB (Old Massett) commented that he thought people were also more influenced by other peoples' thoughts about weather conditions, and less reliant on their observational skills and senses than in the past: "I think it's just more, we're, we have radios, we got TVs, we got people, someone's always screaming oh it's going to blow 20, 30 miles an hour tomorrow, gusting a 100… and people hear that, before you never heard that… you know, you went by your own instincts, and you're, uh, you could read the clouds, and you know, the sky… and listen to the birds and animals and see what kind of reaction they got, that's you know, how they predicted weather before…now we depend on the radio, and news broadcasts, and weather things to find out what the weather is, so, you know, so, I think more, when somebody screams, you know, bad weather, I think everyone's going to get scared and hunker down and stay there". Research participants reported numerous changes in landscape composition, structure, and function due to climate and weather shifts (for example, intense or increased rains or higher tidal levels, Table 2). Sea-level change, particularly rising water levels, was noted throughout the entire study area to varying degrees. However, an important change that was noted only in northern areas of the study is isostatic rebound as a result of glacial retreat. This was also connected to coastal areas getting shallower (KG and AD, Hoonah) and tides being perceived as being lower (KG, AG, LKG, Hoonah). These changes to the landscape, which can also be exacerbated by land-use changes (in varying degrees), affected how participants navigate their territories (e.g. shallower water caused by isostatic rebound made it harder to follow known boating routes) or affected the abundance and distribution of resources (e.g. erosion of slopes caused by increased storms)."

26	Smallholder farmers' awareness and perceptions of climate change in Adama district, central rift valley of Ethiopia	Hundera, H.; Mpandeli, S.; Bantider, A.	Weather and Climate Extremes	2019	10.1016/j.wace.2019.100230	"As it is indicated in the Table 1, the majorities (90.3%) of the respondents reported that they have awareness about climate change in their communities while the remaining 9.7% of them have never come across and aware of the phrase climate change in their local communities. (...) However, out of the respondents who claimed aware of climate change only 11% of them correctly stated about the nature and concept of climate change. (...) Hence, as it was revealed in Table 1 out of the respondents who claimed to have awareness about climate change only about one third (30.9%) of them knew the details of the climate change. This implies that most of the respondents participated in this study do not know the details of climate change. (...) Accordingly, Table 1 revealed that only 41% of them conceptualized climate change as changes in the average weather conditions over extended periods of time (30 years). In this regard, less than half of the respondents correctly explained what climate change all about is while the remaining proportions of the respondents viewed climate change in the form of drought, deforestation and weather conditions. This implies that farmers could not clearly identify the concept of climate change from its cause (deforestations) and impact (drought). This again indicates that rural farming communities are characterized by some gaps in understanding climate change. (...) Even though the majorities (64%) of the respondents correctly understand that climate change is a problem occurred to the world nations, large respondents are still characterized by inherent lack of awareness about climate change impacts and also its threat. Moreover, though most of the smallholder farmers in focus group discussions indicated that they are aware of climate change, it has been observed that they have very limited knowledge about it. This was clearly observed while they were trying to explain what climate change is all about. They usually focus on the temperature and rainfall conditions of one or two years to state climate change which do not coincide with existing literatures. Even, it has been observed that some participants equated climate change to deforestations and drought. (...) Accordingly, out of the total respondents of the study 323 equivalent to 92.1% claimed that they have observed that climate was changed. On the other hand, only 28 respondents equivalent to 7.9% were in the view that climate was not changed so far. (...) As it indicated in Table 2 out of the respondents who reported change of climate, the majorities (84.6%) of them reported that rainfall trend was decreasing over the last 30 years. (...) Supporting the decrement of the rainfall trend of the area, the focus group discussants observed unpredictability of rainfall pattern, prevalence of higher frequency of drought, and below the normal amount in study area. (...) Hence, according to the result of key informant interview during the same season the study area was experienced both higher degrees of drought and extreme rainfall which affected largely farming activities of the communities. As it was observed by elderly peoples, the area was getting drier and drier. (...) Out of the total household questionnaire respondents who choose climate has already changed, large proportions (69.2%) of them pointed out that they observed that temperature had been rising over the last three decades (Table 2). This implies that the majority of the respondents pointed out that temperature was increasing in their area. (...) Additionally, almost all members of the focus group discussions reported that they observed an increasing trend of temperature over the past three decades in their localities. In this context, indicating the reality of temperature increment, one woman from the focus group discussions explained the issue by saying 'biiftuun gara lafaatti waan gad dhiyaatte fakkaata' (it mean that it seems that the sun has changed its position nearer to the earth' s surface). (...) As it has been evident in Table 3 the study result revealed that 87.1% of respondents perceived that growing period of crop has been shortened while 5.6% and 7.6% disagreed and not sure about the statement. The majority (more than 76%) of the respondents also perceived that the variability (late and early) of rainfall nature was considered as the local indictors of changing climate. Decrement of available water bodies and increment of drought occurrences have been also perceived by 75.2% and 70% of the smallholder farmers of the study area respectively as local indicators of climate change. (...) Composite index of respondent's perception was shown in Table 4. Out of the total respondents, 228 of them equivalent to 70.6% had positive perception that climate is changed. In other words, their response towards the indictors of climate change is in line the scientific findings about climate change. Similarly, 74 respondents representing 22.9% had negative perception about climate. This means they were in the view that climate was not changed. The remaining 21 respondents equivalent to 6.5% were characterized by the mixed feeling about the nature of climate change. According to the result therefore it was possible to point out that the majority of the rural farming communities of the study area have positive perception about climate change. They generally perceived that climate change is the threat happened to their livelihoods and this is a reference for the ongoing climate change adaptation practices."
6	Farmers' awareness and perception of climate change impacts: case study of Aguie district in Niger	Ado, A.M.; Leshan, J.; Savadogo, P.; Bo, L.; Shah, A.A.	Environment, Development and Sustainability	2019	10.1007/s10668-018-0173-4	"The study reveals that 84.4% of the respondents were aware of climate change whereas 15.6% were not. Regarding livelihood strategies, farmers recorded the highest score of awareness (87.5%), followed by agro-pas_x0002_torialists (78%). The level of awareness among Fulani people (92.9%) was higher than that of Hausa people (83.60%). In terms of gender, women (66.7%) were less aware than men (80.5%). (...) Figure 2 reveals that the respondents received information about climate change mainly from the local radio station (81.4%). Other sources such as television (3.9%), farmers' association/extension (0.8%) and mobile phones (0.8%) were far less important. The study underlined the absence of some sources of information such as newspapers and the internet. (...) The respondents had difering perceptions of climate change impacts. Ninety-five percent (95%) of respondents reported negative impacts of climate change on their crop pro_x0002_duction, and 92.25% reported negative impacts on their household revenue. This might be due to the high rainfall variability on agriculture production. (...) Most of the respondents reported negative impacts of climate change on crop production and revenue because of high climate variability, specifcally rainfall variability which is a feature of the study area. (...) In addition, Table 3 reveals that very few of the respondents perceived any impacts from climate change on their crop production (3.12%) and revenue (2.5%)."
6	Pathways of socio-ecological resilience to climate change for fisheries through indigenous knowledge	Inaotombi, S.; Mahanta, P.C.	Human and Ecological Risk Assessment	2019	10.1080/10807039.2018.1482197	"In the assessment and exploration of the perceptions of indigenous knowledge systems and climate mechanisms, 87% of the respondents agreed that climate was changing and they had experienced climatic hazards. The prominent indicators perceived in the con_x0002_text of climate change for fisheries during the survey are given below: I. Increased intensity, frequency and severity of extreme weather. II. Erratic rainfall pattern or unreliable monsoon. III. More floods and higher intensity of monsoon wind. IV. Larger storms causing structural damage to ponds and loss of fisheries stocks. V. Decreased endemic or local fish species. VI. Extreme drought; reduced water retention period and reduced fish yield. VII. Increased spread of vector-borne diseases. VIII. Reduced water quality, appearance of fish diseases and parasites. IX. Changes in species composition and fishing efforts affected by changes in bio_x0002_geography of species. X. Declining catch from the wild and lower stock abundance leading to decreased revenue. XI. Changed post-harvest and processing costs and technology due to longer cloudy and rainy periods. XII. Impact on marketing and transportation due to frequent floods and hot dry periods. XIII. Impact on socio-economic conditions and pressure on livelihoods. XIV. Effects on small-scale fisher folks including fish processors and ancillary workers. (...) Surprisingly, 57% of the respondents stated that they were competent in weather and climate forecasting or prediction. They perceived that sudden changes in the behavior of or appearance of environmental entities, e.g., insects, plants or animals and coupled with the irregular extreme weather. For example, if a large group of Reticulitermes insects, a group of termites, come out of the soil during the monsoon season, this predicts that the rain will stop for few days. (...) People predict rain by gazing unusual behavior of Jungle Owlet (Glaucidium sp.). This owlet chirp and beats their wings on the ground before few hours of rain. If frogs (Rana sp.) croak from water bodies in the evening for an extended time, this is said to signify that rain in approaching. Abnormal spider spinning, such as producing shorter and thicker webs, predicts rain. In the night-flowering jasmine, Nyctanthes arbor-tristis, early flowering and larger bud size are said to predict heavy rain for the year. Construction of nests by the crow Corvus splendens on the top branches of the fig Ficus rumphii signifies an expected flood. Such indicators or predictions help to reduce risks presented by different types of environmental hazards."
6	Rural livelihoods and climate change adaptation in laggard transitional economies: A case from Bosnia and Herzegovina	Žurovec, O.; Vedeld, P.O.	Sustainability (Switzerland)	2019	10.3390/su11216079	"Rural households do, as stated, report awareness of recent trends in climate change. The overwhelming majority of respondents in our study perceived an increase in average temperature (92%). (...) The perception of long-term precipitation changes varied by location in this study. While most of the respondents in the northern region perceived a decrease in the total amount of precipitation, most of the respondents in the southern and central region reported di erent distribution of the precipitation over the year. (...) We found little di erences between perceptions of climate changes by wealth groups. The only notable di erence was that part of the respondents (18%) from the wealthiest group did not attribute the increased incidence of extreme weather events to climate change."
6	The salience of climate change in farmer decision-making within smallholder semi-arid agroecosystems	Waldman, K.B.; Attari, S.Z.; Gower, D.B.; Giroux, S.A.; Caylor, K.K.; Evans, T.P.	Climatic Change	2019	10.1007/s10584-019-02498-3	"Farmers overwhelmingly reported that increased drought or extreme weather events, shortening of the length of the growing season, and higher variability in rainfall would negatively impact their agricultural productivity in the next 5 years (96%, 99%, and 96% respectively). Only 25% of farmers considered the previous season to be a "drought," while more than 70% characterized it as below average (rain characterization). Forty-six percent of respondents think there will be less rain in the coming long rains season than the previous long rains season, 49% believe there will be more rain, and only 5% believe the rain will be the same (rain optimism). The majority of farmers estimate an occurrence of drought every 3 to 5 years with some respondents indicating that drought occurred as frequently as every year or as infrequently as 6 or more years (drought probability). Eight percent of farmers think droughts occur more frequently then when they were children, 3% believe they occur with the same frequency, while 17% believe that droughts occur less frequently (drought changing). Farmers estimated the average rain onset to be 1.81 weeks over the last 10 years with a standard deviation of 2.87 years (rain onset delay)."

10	Rethinking indigenous climate governance through climate change and variability discourse by a Zimbabwean rural community	Mugambiwa, S.S.; Rukema, J.R.	International Journal of Climate Change Strategies and Management	2019	10.1108/IJCCSM-11-2018-0074	"Community members in this study perceived climate change as changes taking place in weather conditions over a long period of time. They narrated their experiences in relation to climate change. The most common sentiments were that there is a lack of information and coordination on how to tackle the challenges they are facing as a result of climate change. (...) It has emerged that the community was not aware of what the term "climate change" meant, but they knew that there is a change in weather conditions. As such, during the interview process, the researcher described climate change in the Shona language as "shanduko yemamiriro ekunze" , which can be loosely translated as changes in weather conditions. Most respondents acknowledged that there were numerous changes that they were noticed in weather conditions over the years, and the changes signify a shift from weather conditions they observed in the past. Apart from understanding the changes occurring, the community has also emphasised that there is a need for the local leadership to equip them with knowledge on how to deal with the changes they are currently witnessing. (...) One respondent indicated: We have witnessed that there are numerous changes occurring in weather conditions. We used to receive rain around mid-October but in recent years the first rains come around mid-December and are experiencing extremely hot temperatures as compared to the last fifty years or so. This is a serious challenge that if not addressed, it will seriously damage the lives of many people in this community. I suggest that community engagements with the guidance of the chief and the local leadership will significantly help in addressing the challenges we are currently facing. [Occupation: Farmer, Age: 68, Gender: Male]. (...) Moreover, the other challenge that the community echoed is the dying of crops before harvesting because of extreme heat. The study also found that, in the 1980s, the community used to receive sufficient rainfall; however, starting from the early 1990s, the amount of rain they received began to reduce. However, from around 1992 to this day, rainfall is not predictable anymore. This implies that the community also perceived climate change based on the shift in rainfall patterns and temperatures and its effects. Comparative explanation of weather conditions by the community substantiated the community's perception of climate change as the occurrence of a shift in temperature and rainfall patterns. To that effect, one of the participants indicated that: The changes we are witnessing in seasons are immensely visible in the sense that long back we used to receive more rains and reap more harvest but nowadays the rains are unpredictable sometimes our crops die from heat because of lack of sufficient rains. [Age: 70; Gender: Male; Occupation: Farmer]."
2	Small-scale fishers' perceptions of climate change and its consequences on fisheries: the case of Sanyathi fishing basin, Lake Kariba, Zimbabwe	Muringai, R.T.; Naidoo, D.; Mafongoya, P.; Sibanda, M.	Transactions of the Royal Society of South Africa	2019	10.1080/0035919X.2019.1639564	"Fishers have different levels of knowledge and awareness about the climate change phenomenon. Results (Table 2) show that 90% of the fishers were aware of climate change. Fishers described climate change as the changes in weather outlook, decreasing rainfall, increased occurrence of severe weather events and increasing hot days. (...) More than 71% of the respondents noted the weather conditions have changed compared to 10 years ago. Fishers identified loss of fish (68%), strong winds (53%), strong water currents (43%), droughts (74%), hunger (13%), increasing temperatures (70%) and decreasing rainfall (75%), as some of the challenges associated with climate variability and change. Figure 2 shows that about 42% of the fishers reported that there is a slow change of climatic variables, particularly rainfall and precipitation. Close to 40% of the fishers indicated that there are severe changes in climate conditions. On the other hand, 13.6% and 4.5% of the fishers indicated "no visible change" and "no change" of climate conditions, respectively. The fishers agreed that climatic conditions have changed in Sanyathi fishing basin. The respondents reported that maximum temperatures have increased over the years. Figure 3 shows that 70% of the respondents indicated that temperatures in Sanyathi fishing basin are increasing. 21% of the fishers reported that temperatures have been decreasing in the area and less than 10% reported no changes in temperatures observed. (...) A substantial percentage of fishers in Sanyathi fishing basin perceived that rainfall patterns in the area have changed. Over 76% of the fishers indicated that rainfall received in Sanyathi fishing basin is decreasing (Figure 6). 15% of the fishers believe that there is an increase in the amount of rainfall received and less than 10% do not believe that there has been any change in rainfall patterns. (...) There was a significant relationship between fishers' perceptions of changes in climatic variables (rainfall and temperature) and fish catches ($p<0.05$). According to Table 3, most fishers (80%) described that their monthly fish catches are declining, 68% of the fishers perceive that climate change is a driver to declining fish catches. (...) On the other hand, about 20% of the fishers do not believe that changes in climatic conditions can impact on fish catches. (...) Fishers (74%) identified an increased occurrence of droughts as an indicator of changing climatic patterns. Furthermore, fishers indicated that poor rainfall distribution (68%), dam water levels (62%) and increasing temperature (61%) are some of the indicators of climate variability and change. Floods, cyclones and frequent wildfires are some of the indicators of climate change identified by the respondents. From the study results, it can be concluded that most of the fishers could identify major climate change indicators such as frequent drought occurrence, decreasing dam water levels, increasing temperatures and poor rainfall distribution. The ability of the fishers to identify these major indicators might be because fishers are experiencing the changes that are becoming more observable."
26	Indigenous perceptions of climate anomalies in Malaysian Borneo	van Gevelt, T.; Abok, H.; Bennett, M.M.; Fam, S.D.; George, F.; Kulathuramaiyer, N.; Low, C.T.; Zaman, T.	Global Environmental Change	2019	10.1016/j.gloenvcha.2019.101974	"For our measure of salience, 71 individuals have experienced what they consider are direct impacts attributable to climate anomalies within the last three years. (...) Figs. 2 and 3 present respondent perceptions of deviations from their self-reported long-term means by season for rainfall and temperature, respectively. (...) Starting with rainfall in Fig. 2, we can see that there are many individuals for each season who perceive decreases, increases and no change. The diversity of perceptions is best illustrated through an example. If we take the second wet season (W2) in 2017 as an example, we can see that 57 individuals stated that there was no deviation from the long-term mean and 82 individuals stated that rainfall was lower than their perceived long-term averages. If we turn to Supplementary Table 2, we see that from the 61 individuals who stated that there was a positive deviation from the long-term mean, 31 individuals perceived only a one-level increase, 24 individuals perceived a two-level increase and six individuals perceived a three-level increase. From the 82 individuals who perceived a negative deviation from the long-term mean, 43 perceived a one-level decrease, 17 perceived a two-level decrease, six perceived a three-level decrease and four perceived a four-level decrease. Turning to temperature in Fig. 3, we continue to see a wide range of perceptions, although the majority of individuals perceived above average temperatures in every season.(...) While over half of our sample (104 individuals) perceived an increase in temperature of at least one level, 41 perceived no deviation from the long-term mean and 55 perceived a decrease in temperature of at least one level. As seen in Supplementary Table 2, among the 104 individuals who perceived an increase in temperature, 43 perceived an increase of one-level, 30 perceived an increase of two levels, 18 perceived an increase of three levels, 11 perceived an increase of four-levels and two perceived an increase of five levels. Among the 55 who perceived a decrease in temperature, 30 perceived a decrease of one level, 16 perceived a decrease of two-levels, five perceived a decrease of three-levels, three perceived a decrease of four-levels and one perceived a decrease of five-levels. (...) Looking at rainfall, we see that the proportion of individuals with broadly aligned perceptions ranges from 0.19 to 0.36. Our results suggest that perceptions during seasons where there was a statistical climate anomaly were generally more aligned than for seasons where there was no statistical anomaly, with between 30 and 36 percent of our respondents having perceived changes broadly consistent with our anomaly measure. For temperature, we note a similar pattern where the proportion of individuals with broadly aligned perceptions is notably higher for seasons where there were statistical climate anomalies (0.37–0.52) than for seasons where there were no statistical anomalies (0.25–0.26). (...) This suggests that every additional Oroo' sign known by the average respondent is associated with approximately 0.072 more seasons where perceptions of temperature anomalies are aligned with the instrumental data. Put another way, an individual who identified all ten Oroo' signs correctly is likely to have perceptions that corresponded with the instrumental climate data 6% more frequently than an individual who identified no Oroo' signs correctly."
10	Exploring the link between climate change perceptions and adaptation strategies among smallholder farmers in Chimanimani district of Zimbabwe	Mutandwa, E.; Hanyani-Mlambo, B.; Manzvera, J.	International Journal of Social Economics	2019	10.1108/IJSE-12-2018-0654	"A large proportion of the farmers were of the opinion that climate change had occurred in the past 10 years (85 percent). Changes in precipitation and temperature were the two main variables used as indicators of climate change. Amongst the farmers who perceived that climate change had taken place, 60 percent of them noticed rise in temperature while 15 percent noted a decline in temperature from the past ten years. Although a slight change in precipitation was noticed since only 16 percent noticed an increase and 24 percent a decline in precipitation, 64 percent of sample opined that Chimanimani district is now characterized by late onset and premature end of rainfall seasons."
6	Climate change and pastoralists: perceptions and adaptation in montane Kenya	Cuni-Sanchez, A.; Omeny, P.; Pfeifer, M.; Olaka, L.; Mamo, M.B.; Marchant, R.; Burgess, N.D.	Climate and Development	2019	10.1080/17565529.2018.1454880	"In all FGDs it was reported that now (1) there were no rains between the rainy seasons and (2) rains were unreliable both in quantity, duration and even in the rainy season event taking place (non-event), see Figure 2. Before you would know when the rains would come and how long they would last, now sometimes the rains skip (non-occurrence of rains), and even when it rains you cannot tell if they will be the long rains, the short rains, or useless rains (very little rain). (participant comment in Mt Kulal). Similarly, communities reported that fog had decreased in amount and duration so that now (1) there was no fog outside the rainy season and (2) the days with fog have few hours of fog (Figure 2). Some comments made were 'before one could not see the sun for several days or even a whole week', 'before we had to bring our maize to the lowlands so it would dry properly', 'before you could hang your washed clothes and they would not dry for days' (participants' comments in Mt Marsabit). While in Mt Kulal and Mt Marsabit communities reported a general increase in temperatures; in Mt Nyiro they reported no change in temperatures. In all mountains, most communities reported increased winds (Figure 2). (...) No differences between ethnic groups were observed in perceptions of climatic changes around Mt Marsabit or between mountains (Table 2). (...) Communities related the perceived changes in climate to God or environmental degradation (destruction of the forest) (about 50% and 20% of the FGDs, respectively, see Figure 2). While God was the most common explanation in Mt Nyiro and Mt Kulal, in Mt Marsabit it was environmental degradation. Interestingly, in 20% of the FGDs, it was mentioned that God was angry at them because of ethnic conflicts and had sent them drought spells (Figure 2)."

6	Climate shocks and responses in Karnali-Mahakali Basins, Western Nepal	Pandey, V.P.; Sharma, A.; Dhaubanjar, S.; Bharati, L.; Joshi, I.R.	Climate	2019	10.3390/CLI 7070092	"Floods and droughts were identified as the two key climate risks that are affecting agriculture and livelihoods in the study region. (...) Out of 3660 surveyed HHs across Western Nepal basin, 79% reported experiencing at least one type of climate shock. In an aggregate, 54% of the respondents have perceived drought, whereas hailstorm is experienced by 52%, untimely rain by 33%, and serious crop damage by some 24%. (...) Disaggregated results show that perception varies with the region. A majority of respondents who had experienced most of the considered shocks came from the hill region (e.g., drought, untimely rain, irregular weather, hailstorm, etc.). Floods on the other hand, are the most common in Tarai. Due to the topography of the Tarai plains, the entire region is vulnerable to flooding and inundation. (...) Across the regional scale, the pre-dominant climate shocks were droughts (54%), hailstorms (52%), and untimely rains (33%) (Figure 4a). However, the results vary across the physiographic regions. For example, the climate shock pre-dominant in Tarai is the flood (60%) and followed by serious pest damage to crop (54%) and market shocks (50%) (Figure 4b). (...) In case of the hill region, untimely rain is the pre-dominant climate shocks (63%) followed by hailstorm (61%), and irregular weather (59%) (Figure 4b); whereas for the Mountains, market shocks (41%), animal disease (33%), droughts (29%), hailstorm (29%), and irregular weather (29%) are the prevailing form of climate shocks (Figure 4b). Survey results were also disaggregated by five sub-basins as shown in Figure 5. Among the five basins considered, respondents from the Karnali-Main, comprising largely of the mountain and hill regions, experienced hailstorms and droughts the most, while flooding (Figure 5a) was experienced the most in the Mahakali and Mohana basins. However, the dominance of specific shocks is not as persistent at basin scale as seen in regional scales with values lower than 40% reported for most shocks across the basins. Thirty percent and 17% of the respondents in Karnali-Main and Seti-Karnali basins have experienced droughts in the last five years, respectively. Drought, hailstorm, untimely rain and irregular weather were less prevalent in the Mohana basin compared to other basins. However, flood and serious pest damage to the crops are the most dominant in the Mohana, the basin originating in the mid-hills and most of the areas lying in southern plain of Nepal. (...) In terms of frequency of climate shocks, as tabulated in Tables A2 and A3, floods were noted on an average of three times over the last five-year period, with some respondents saying they had experienced flooding events up to 65 times within the same time frame. Similarly, respondents noted that droughts occurred at least twice in the five years, with the maximum frequency reported at 36. (...) The highest proportion of the HHs perceived medium severity of risks to the shocks for droughts (45%), untimely rain (55%), irregular weather (46%), animal disease (49%), serious crop damage (61%), and market shocks (49%). It is worthy to note that the most commonly reported shock earlier was droughts, with 54% of the respondents having experienced them, however, their perceived risks are medium across all regions. Over 53% reported high severity of the risks for flood and 41% for hailstorm. (...) Across the basin categories, it is observed that droughts were most commonly felt in the Karnali basin, with a majority (46%) of the respondents describing the severity as medium. The severity of risks from flooding is consistently considered as "medium" across all three basins with 32%, 35% and 44% of respondents in the Karnali, Mahakali and Mohana, respectively, experiencing medium severity of the risks (Table 3). However, respondents across the study area during the survey as well as FGDs perceive that the damage potential of the recent flood events are increasing. (...) In general, perceived severity of risks associated with most of the climate shocks is medium. On average, over the past five years, a HH in the Tarai experienced flooding more frequently (3.56 times) than those households in the mountain (2.32 times) and hill (2.25 times) regions (Table A2)."
6	Perceived climate variability and farm level adaptation in the Central River Region of The Gambia	Bagagnan, A.R.; Ouedraogo, I.; Fonta, W.M.	Atmosphere	2019	10.3390/atmos10070423	"Table 2 shows the percentage of the respondents' perceived trend of five different variables related to extreme weather and climate events during the past 20 years. In general, the respondents perceive an increase in the heat and storm events and a decrease in the growing period and heavy rain events. About 85% of the interviewed farmers perceived an increase in heat of which nearly 20% perceived a very strong increase. Most of the respondents perceived an increase in storm (77.8%), of which 14.5% stated the storms are getting stronger and stronger. However, farmers perceived a decreasing trend for the variables related to rainfall. For instance, the length of the rainy season is perceived by 70% of the respondent farmers to be shortening. About 79% of the respondents perceive that the number of the heavy rains has reduced during the last 20 years. During the FGDs, one of the participants stated that "Heat from the sun (environment) heats the soil and when both soil and environment heat combine, it a ects the crop". Some respondents mention cutting down trees as well as war in the western world as causes of the observed changes. They went further to explain that trees would signify rainfall and that fewer trees would mean less rainfall."
6	Encounters between experiences and measurements: The role of local knowledge in climate change research	Kieslinger, J.; Pohle, P.; Buitrón, V.; Peters, T.	Mountain Research and Development	2019	10.1659/MRD-JOURNAL-D-18-00063.1	"Participants (M1, M2, M3, M4) reported an increase in temperature and higher daily thermal amplitudes. High variation of the start of the rainy season was also observed, with a shift from the end (October–December) to the beginning of the year (January–February) as well as a foreshortening of the season. According to their statements, rainfall amounts and heavy rain events during the rainy seasons increased, and severe droughts during the dry seasons decreased. "Here, we are affected by both [heavy rainfall and dry periods]. In the past, about 38 years ago, the summer [dry periods] affected us more, but now it's the rainfall. It's raining too heavily and the temperatures are crazy, even the animals get sick because of the strong heat. . . . Now the sun is too hot. (respondent HLV1b, M3 2016)". "In the past the rains [rainy seasons] were fixed, . . . the seasons have changed a lot. [In the past,] already in October, there were the drizzling rains; we started to prepare the fields in November and the winter [rainy season] came in December. Now sometimes it's coming in February. (respondent HS2, M3 2016)". (...) They described changes in the beginning and duration of the seasons with a shift from the end to the beginning of the year and a foreshortening of the rainy seasons with a decline in precipitation in October, November, December, May, and June. (...) During the workshops and interviews (M1, M2, M3, M4), participants reported many impacts of the observed climatic changes and extreme events (Table 2). Concerning changing rainfall patterns, local stakeholders stated that variability in seasons, rainfall duration, and intensity affected rural livelihoods: "Here we abide by the two seasons, summer [dry season] and winter [rainy season]. . . . In the past, nature was wise and showed us when the seasons began. Now it isn't like that anymore, the indicators, like flowering of trees or the appearance and disappearance of certain animals, aren't working". (resp. E1, M1 2016). "It's not raining like it used to, when a lot of water remained in the creeks. . . . Now . . . there isn't much water left; in the past, the summer [dry season] came and they [the creeks] didn't dry out". (resp. E4, M1 2015). "The winter should be regular because more humidity infiltrates [the ground] and heavy rainfall only washes everything away, leading to a collapse of the water supply system and sedimentation". (resp. E1, M1 2016). "
10	Mountain farming systems' exposure and sensitivity to climate change and variability: Agroforestry and conventional agriculture systems compared in Ecuador's Indigenous Territory of Kayambi people	Córdova, R.; Hogarth, N.J.; Kanninen, M.	Sustainability (Switzerland)	2019	10.3390/su11092623	"The results show that perceptions of the gradual climate changes during last decade are similar between agroforesters and conventional farmers. Among gradual climate changes, there are clear perceptions of the increase of annual temperature and a reduction of annual precipitation. The same perception tendencies were found also in rainy and dry seasons. In the case of extreme climatic events, a clear perception tendency in both farming system types was the reduction of heavy rainfall and hail events, and the increase of heavy windstorms, droughts/dry periods, heat waves/warm periods and cold periods/frost. Furthermore, perceptions of agroforesters and conventional farmers about other climate-related events are also similar, indicating stable conditions (not changes). In addition, farmers' perceptions of gradual climate changes, extreme events and other climate-related events for the next decade are similar in both system types, and coincide with the perception tendencies described above.(...) Taking into account the specific incidence of climate stressors, temperature increase and rain reduction are perceived at similar levels (100%) in both farming systems. In addition, conventional farmers perceived greater exposure to droughts (20%), solar radiation (43%) and PWD outbreaks (40%) than agroforesters."
6	Pastoralists' perception of and adaptation strategies for climate change: associations with observed climate variability	Zhang, Q.; Cui, F.; Dai, L.; Feng, B.; Lu, Y.; Tang , H.	Natural Hazards	2019	10.1007/s11069-019-03620-5	"The study results (Table 4) show that the majority of the respondents believed that rainfall has decreased (86.76%) and temperature has increased (72.06%) over the past few decades. In addition, a large number of pastoralists perceived a significant increase in drought (87.69%). Very few pastoralists indicated no change in rainfall (4.41%) and a decrease in drought (3.01%). During our interviews with the pastoralists, the majority (68.21%) mentioned that rainfall in the summer decreased significantly compared with the past, while the frequency of heavy rains increased; they also perceived that the timing of the rainfall changed, being either advanced or delayed. Furthermore, 70.26% stated that the frequency of drought in summer increased in the past 20 years; beginning in 2013, drought occurred for five consecutive years. Regarding winter, 52.78% of the respondents perceived increasingly warmer temperatures and decreasing cold days in winter, and some pastoralists (10.60%) indicated a decreased occurrence of snowstorms. A small group (23.16%) perceived that the frequency of drought occurring increased gradually, often coinciding with the summer drought. In addition, the pastoralists had a weaker perception of climate parameters in spring and autumn compared with winter and summer. This result appears to indicate that pastoralists are more concerned about extreme weather and tend to give greater weight to negative impacts leading to higher risk perception because extreme weather is likely to have an adverse impact on practitioners who depend on grassland resources for their livelihoods. Local people have experienced various impacts of climate change (Fig. 6). The majority of households, 87.35%, indicated that drought resulted in grassland degradation, followed by increased production costs (79.39%), decreased grass production and the mature ratio of livestock (65.81%), and weakened income (72.37%). Furthermore, 65.81% of households reported increased temperature and abnormal precipitation, increased livestock incidences (39.81%), and increased pests and diseases (35.60%). In addition, 53.40% of households observed a decreasing water level in groundwater wells, and 41.22% perceived the local ecological environment to be degrading. In this interview, pastoralists generally mentioned the frequent droughts since 2000."

6	Indigenous people's perceptions about climate change, forest resource management, and coping strategies: a comparative study in Bangladesh	Ahmed, M.N.Q.; Atiqul Haq, S.M.	Environment, Development and Sustainability	2019	10.1007/s10668-017-0055-1	"Figure 2 presents a graph summarizing respondents' beliefs about the impacts and causes of climate change. This study found that in both communities, the phrase ''climate change'' is not familiar to every respondent. A higher proportion of Tripura respondents (75%) had heard of it than Khasia (66.7%). The major ways people heard about it were through television (41.7% Khasia, 46.7% Tripura), newspapers (16.7% Khasia, 15.6% Tripura), NGOs (16.7% Khasia, 6.7% Tripura), and researchers (8.3% Khasia, 11.1% Tripura). Many respondents from both study areas mentioned that they believe temperatures are increasing (72.2% Khasia, 60% Tripura), while more Tripura (23.3%) felt that it is decreasing than Khasia (5.6%), and some respondents did not feel temperatures are changing at all (22.2% Khasia, 16.7% Tripura). Regarding annual rainfall, there were also differences in opinion between the communities: More Khasia (61.1%) felt annual rainfall was decreasing than Tripura (41.7%); more Tripura (45%) felt it was increasing than Khasia (22.2%); and nearly 15% of respondents from both communities felt patterns were not changing. Respondents from both communities (72.2% Khasia, 58.3% Tripura) felt that climate change has an adverse impact on their livelihoods. People from the two communities responded in different proportions in terms of the reasons for climate change: 22.2% of Khasia and 30% of Tripura considered that deforestation is human induced, while 33.3 and 21.7%, respectively, felt that climate change is a natural process, and 16.7 and 13.3%, respectively, felt it was a consequence of disobeying God's commandments. In the case of Tripura, 5% of respondents felt that the use of chemical fertilizers causes climate change. About one-fifth of respondents from both communities said that they do not know the exact reasons for climate change. Figure 3 shows respondents' perceptions about the effects of climate change. It reveals that most Khasia respondents agree with Stat-1—they believe that climate change is a threat—while a large number of Tripura respondents did not think so. Most respondents from both localities had similar responses to Stat-2 (Climate change is a local problem). Most Khasia and many Tripura respondents disagree with Stat-3—they do not believe that human beings are unable to combat climate change. A large proportion of respondents from both communities agreed on Stat-4 (Natural causes alone are responsible for climate change), Stat-5 (Human activities are to be blamed for climate change), and Stat-6 (Sinful human acts are inviting climate change). Both Khasia and Tripura people agreed that temperatures are increasing (Stat-7) and rainfall is decreasing (Stat-8). Most Khasia respondents took a neutral position as to whether drought is increasing, while most Tripura agreed that drought is on the increase (Stat-9). A majority of respondents from both localities agreed on Stat-10 (Climate change leads to a decrease in agricultural production), Stat-11 (Climate change has a detrimental impact on public health), and Stat-12 (Climate change has an impact on people's livelihoods). A majority of respondents also agreed with Stat-13 (The government is responsible for fighting climate change), Stat-14 (Human beings need to adopt a variety of strategies to adapt to the effects of climate change), and Stat-15 (Public awareness is required for combating climate change). (...) From Tables 4 and 5 it is evident that male and female Khasia respondents are moreconcerned about climate change in Bangladesh than corresponding Tripura respondents as their mean scores are higher. On the other hand, male and female Tripura respondents are more concerned than corresponding Khasia respondents in terms of what they view as the causes of climate change, trends resulting from climate change, the impacts of climate change, and mitigation of those impacts."
10	Cognitive biases about climate variability in smallholder farming systems in Zambia	Waldman, K.B.; Vergopolan, N.; Attari, S.Z.; Sheffield, J.; Estes, L.D.; Caylor, K.K.; Evans, T.P.	Weather, Climate, and Society	2019	10.1175/WCAS-D-18-0050.1	"Farmers perceive that rains began earlier the farther back in time they were asked to recall rainfall onset dates (see Table 2). (...) On average, farmers perceived that the rainy season onset during the 2015/16 growing season (2015 from here on) was 21.8 days later than it was 10 years ago and approximately 12.6 days later than it was during the 2012/13 season. (...) Additionally, the number of people who were unable to recall rainy season onset increased with recall each year, except for ''about a decade ago'' (;2005), when 98% of respondents provided a rainy season onset date. While farmers admittedly have difficulty recalling rainy season onset two to four seasons ago, they nearly all have a perception about a longer time horizon. (...) The vast majority of farmers (88%) perceive the rain onset to be getting later over the last 10 years, indicated by a positive difference between 2015/16 and ;2005. Fewer than 5% of farmers perceived the rains to be getting earlier (negative value), and approximately 7% perceived no difference in rain onset. On average, farmers perceive the rains to be arriving 21.9 days (or about 3 weeks) later over the 10-yr period. (...) On average, men perceive the rains to start 3.5 days later over a 10-yr period than women. One additional year of education reduces the perception of the rainy season onset arriving later by almost a week. Another significant variable that is associated with the perception that the rains are getting later is the length of the longest dry spell in the previous season. For each additional day of dry spell, farmers perceive the rains to be 0.15 days later. (...) onset. The most prevalent response from 36% of respondents is that they perceive the rainy season to start after the first day of heavy rainfall. Slightly fewer respondents (31%) reported that they perceive the rainy season to start after a few consecutive days of rainfall. Approximately 17% of respondents reported using a heuristic that could be categorized as other, mostly involving movement, size, and density of storm clouds but also ecological indicators such as the presence of certain butterfly species. About 15% of respondents perceive the rainy season to start when there is sufficient soil moisture. Only about2% of respondents define the rainy season by the cumulative amount of rain."
2	Climate change and finger millet: Perception, trend and impact on yield in different ecological regions in Central Nepal	Luitel, D.R.; Siwakoti, M.; Jha, P.K.	Journal of Mountain Science	2019	10.1007/s11629-018-5165-1	"Change in the ambient climatic condition, yield of the crops, phenological changes in plants, changes on calendar of major crops, ecology of forests and other natural resources, frequency of natural disasters, and invasion of new insects and pests were well noted by the local people. However, observation on climatic variables varied according to the ecological regions. 65% of respondents from lower tropical, 61% from upper tropical to subtropical and 52% from the temperate climatic region felt that the summer season starts earlier than 40-50 years ago. 38% of respondents in the temperate climatic region feel that there is no change in summer seasonality. The perception of respondents on the duration of winter days varies. 65% of respondents from lower tropical climatic region and 23% from upper tropical to subtropical climatic region think that the duration of winter days are currently longer, but 35%, 61% and 24% of respondents from lower tropical, upper tropical to subtropical and temperate climatic region, respectively, feel that the winter days are now shorter than half a century ago. Most of the respondents (97% in lower tropical, 100% in upper tropical to subtropical, 52% in temperate climatic regions mentioned that the yield of local crops such as finger millet has now declined compared to the last four to five decades. Respondents (48%) of temperate climatic region possessed an opposite view, stating that the yield of some local crops, namely buckwheat and barley, had increased due to prolonged summer days. (...) Almost all respondents from lower tropical, upper tropical to subtropical and temperate climatic region agree that days are now warmer compared to the past. All respondents felt that rainfall is unpredictable and declining recently throughout central Nepal. 38% of respondents from the temperate climatic region differed and stated that rainfall has increased but rainy days have decreased. Similarly, all respondents mentioned that the rate of winter rain is decreasing. All respondents from Manang (temperate climatic region) revealed that onset of snowfall is delayed now. The majority of respondents in upper tropical to subtropical climatic region voiced that the drought days have increased. However, 48% of respondents from temperate climatic region stated that there is no change in drought conditions in recent days. (...) All respondents in the temperate climatic region felt that the snowfall is delayed now compared to 50-55 years ago. Similarly, 52% of respondents mentioned that there was no change on the incidence of avalanches in Manang in the past, whereas, 48% of respondents felt that the incidence of avalanches increased. Regarding wildfires, flooding, and landslides, there were varied views in three ecological regions in central Nepal. Most of the respondents (94% from lower tropical, 87% from upper tropical to subtropical and 100% respondents from temperate climatic region) had the opinion that there was no change of fire frequency, but a small fraction of respondents argued that there had been a decrease in the rate of fire. Similarly, 23% of respondents from lower tropical climatic region and 63% from upper tropical to subtropical climatic region indicated an increase in incidences of flooding and landslides, whereas 64% from lower tropical, 7% from upper tropical to subtropical and 100% of respondents from temperate climatic region indicated there is no change in the last five decades (Table 5)".
6	Cryospheric hazards and risk perceptions in the Sagarmatha (Mt. Everest) National Park and Buffer Zone, Nepal	Sherpa, S.F.; Shrestha, M.; Eakin, H.; Boone, C.G.	Natural Hazards	2019	10.1007/s11069-018-3560-0	"In this survey, the highest portion of people, 27%, ranked earthquake as a most hazardous and risky as shown in Fig. 4. Since the survey was conducted a year after the Gorkha Earthquake of Nepal in April 2015 (7.4 magnitude), most respondents ranked earthquake as most hazardous, as recent or common events are more cognitively available. This multiple response ranking also showed 23% of respondents perceived glacial flood as a critical hazard in the region. Blizzards, drought, and landslide are perceived as hazardous by 11%, 9%, and 5% of the respondents, respectively, whereas hailstorms and the lack of timely snow are perceived as hazardous by 4% of respondents each, followed by excess or erratic rainfall by 3% respondents, and less than 1% respondents identified other different hazard categories. (...) Response of experiences of climate hazards in the last ten years obtained from the household survey showed that the highest number of respondents (31%) has responded experiencing blizzard in the Everest region of Nepal. 28% of the respondent have mentioned glacial flooding, and 27% cited droughts as climate hazard experienced in last 10 years as shown in Table 3. Torrential rains and hailstorm were cited by 21% and 8% of respondents, respectively. (...) A negative correlation is observed with age and perception of glacial lake as a threat, indicating that older generation do not perceive glacial lakes as threat. Furthermore, a significant negative correlation between people involved in farming and female population with perception on glacial lake as threat showed that people of these two categories do not perceive glacial lake as threat (Table 4). However, population involved in tourism seem to perceive glacial lake as threat as shown in Table 4."
6	Recent intensification of the seasonal rainfall cycle in equatorial Africa revealed by farmer perceptions, satellite-based estimates, and ground-based station measurements	Salerno, J.; Diem, J.E.; Konecky, B.L.; Hartter, J.	Climatic Change	2019	10.1007/s10584-019-02370-4	"Across most of the study region, farmers show marked uniformity in their perceptions of seasonal rainfall change. Compared to at least 10 years ago, farmers stated that the first and second rainy seasons were becoming wetter (72% and 86%, respectively; Fig. 2, blue bars), and the first and second dry seasons were becoming drier (80% and 93%, respectively; Fig. 2, red bars). (...) Disagreement and uncertainty among households were evident at the Kibale sites, particularly Kibale North. A minority of Kibale North farmers observed the first rainy season becoming wetter (25%) and the first dry becoming drier (31%), in contrast to what was nearly consensus in other sites. The second rainy and dry seasons more closely resembled the other sites (with 51% and 83% reporting wetter second rains and drier second dry, respectively)."

6	Fishers' decisions to adopt adaptation strategies and expectations for their children to pursue the same profession in Chumphon Province, Thailand	Sereenonchai, S.; Arunrat, N.	Climate	2019	10.3390/cli7020034	"The results showed that the fishers had different levels of perception of climate change impacts: believe climate change has led to increases in air temperature (82.50%), sea water temperature (58.30%), inland precipitation (45.30%), offshore precipitation (68.42%), and storms (71.60%), whereas 61.20% did not perceive any changes in saline water intrusion (Figure 2). (...) Based on in-depth interviews and focus group discussions with the fishers and coastal communities in Chumphon Province to understand their indigenous knowledge, we revealed that: (1) in very hot areas, aquatic animals will not mate or lay eggs, resulting in smaller numbers—especially squid and blue swimming crabs; (2) when they are sailing in the midst of the sea, if they notice any area with unclear water, they know that squids will not be found in the area; (3) if the wind keeps changing its direction back and forth, only a small number of fish will be found; (4) when fish are seen swimming still, it means that a strong wind, waves and rainfall are coming shortly; (5) when squids are not out to enjoy the light from squid boats, it signals a potential storm that night; and (6) when aquatic animals such as fish, crabs and shellfish uncharacteristically disappear, and when terrestrial animals perform certain actions, such as ants moving their eggs well above the ground, or cockroaches flying, this suggests that a storm is inbound."
6	Variability in perceptions of household livelihood resilience and drought at the intersection of gender and ethnicity	Quandt, A.	Climatic Change	2019	10.1007/s10584-018-2343-7	"While perceptions of changes in drought did not significantly vary between men and women, they were significantly correlated with ethnic group (Fig. 3a and d). Perceptions of drought frequency ($\chi2 = 31.83$, $p = 0.023$) and severity ($\chi2 = 36.0$, $p = 0.007$) were also significantly correlated with major livelihood activity. For example, 42.86% of respondents whose major livelihood is livestock keeping reported that drought is more severe, while 54.1% of households whose major livelihood is agriculture said that drought is less severe than 10 years ago."
6	Climate change perception: an analysis of climate change and risk perceptions among farmer types of Indian Western Himalayas	Shukla, R.; Agarwal, A.; Sachdeva, K.; Kurths, J.; Joshi, P.K.	Climatic Change	2019	10.1007/s10584-018-2314-z	"About 83% of the farmers were not aware of the term “climate change,” yet the majority of the farmers (97%) believed that climate has certainly changed from what they recall of 20–25 years ago. Of the farmers that were aware of the term, climate change have acquired knowledge through camps mostly arranged by local NGOs. Figure 4a shows the overall perception of all the interviewed farmers regarding critical climatic variables, i.e., temperature and precipitation for both summer and winter season. With regard to perceived changes in precipitation (Fig. 4a), it is evident that an overwhelming majority of farmers perceive a decrease in summer (99%) and winter (95%) precipitation. Since farming in study regions is predominantly rainfed, farmers had vivid observations regarding the changes in timing and intensity of the rainfall. (...) Farmers extensively spoke about the erratic and uncertain rainfall patterns in both seasons. Monsoon rainfall is critical for Kharif crops like rice, finger millets, and pulses and winter precipitation is essential for rabi crops such as wheat. The majority of the farmers asserted that they are unable to determine when to start their sowing season due to the unpredictable nature of rainfall. This has altered the famers’ traditional cropping calendar. Further, due to the subnormal intensity of precipitation, the incidences of drought have become frequent. The amount of snowfall was also reported to have decreased appreciably. A farmer quoted, “earlier, we could not see stars in the sky for the whole of the July and August. Continuous rains for days during the monsoon season in old times was good for the soil and the crops. But now, sudden and untimely torrential rains are spoiling the soil as well as the crops. Rains have completely disappointed us.” Another farmer form Chakrata narrated, “earlier the snow was about a foot high and it used to stay for weeks but now if ever there is snowfall it is less than 5 inches and melts within a day.”With reference to temperature a farmer stated, “summers are more intense and dry now because of which the crops ripen at an early stage without proper grain development.” An old-age farmer remarked, “it is dry winter now. Such conditions are different from what we had experienced as young in the village. Because of the dryness there is more pest infestation and health impacts for livestock and humans.” Majority of farmers (96%) perceive an increase in temperature in the summer season. Excessive scorching and wilting of crops was reported by the farmers due to the higher heat accumulation. Enhanced warming during the summer season was linked to a decrease in rainfall by many farmers. Besides, in earlier times, there was no need of electric fans, but now farmers feel it has become impossible to manage without them. In contrast to the perception of summer temperature, a greater variationwas observed in the perception for winter temperaturewith 48% of the farmers reporting a decrease, 33% an increase, and the rest 19% perceived no change in the winter temperature (Fig. 4a). Farmers who reported an increase in winter temperature connected their perception to the reduced intensity of snowfall, whereas for some farmers, the winter seasons have become drier, thereby chillier with frequent incidences of fog, frost, and hailstorm."
10	Climate change perceptions and attitudes to smallholder adaptation in northwestern Nigerian drylands	Jellason, N.P.; Baines, R.N.; Conway, J.S.; Ogbaga, C.C.	Social Sciences	2019	10.3390/socsci8020031	not applicable
16	Adaptive strategies of smallholder farming systems to changing climate conditions in the vicinity of kogyae strict nature reserve within the forest-savanna transitional zone of Ghana	Pabi, O.; Ayivor, J.S.; Ofori, B.D.	West African Journal of Applied Ecology	2019		"Farmers have observed changes in climate in terms of rainfall and temperature variations. To many, annual rainfall amount has decreased. Others claimed there has been uncertainty in the onset of rainy season: it may either delay or come quite early. Others indicated that rainfall has become quite erratic and unreliable. This could be in terms of amount, distribution, onset or cessation. Early cessation and poor distribution results in poor or failed cropping. Increased frequencies in bush burning were mentioned as a direct impact of temperature increases and reduced rainfall. (...) The farmers relied on the onset of rainy season to prepare their lands for cultivation. Over the years, they have gained experience in the use of weather patterns to predict the onset of rains. After clearing the land, they would wait till the rains begin for some days before seeds were sowed. If rainfall is inadequate or delays, seeds may fail to germinate or seedlings may die. Farmers were aware that drought condition inhibits flowering, causes abortion of fruits or inhibits grain filling. They showed the research team poorly developed maize cobs (Figure 9) they harvested in the previous seasons when the rainfall was poor."

6	Indigenous knowledge and farmer perceptions of climate and ecological changes in the bamenda highlands of cameroon: Insights from the bui plateau	Tume, S.J.P.; Kimengsi, J.N.; Fogwe, Z.N.	Climate	2019	10.3390/cli7120138	"One-third (32.2%) of farmers have very high knowledge of climate change, 54.8% have high knowledge, 4.5% have very low, 5.5% have low, and only 3% have no knowledge. Sources of indigenous weather activities on the Bui Plateau are through plant behavior (49.4%), personal intuitive perception (18.9%), animal behavior (12.2%), consultation of traditional weather seers (4.7%), stream behavior (6%), and consultation of community elders (3.7%) (Table 3). A small proportion of inhabitants of the population of the Bui Plateau uses conventional sources such as television, (0.8%), meteorological services (1.7%), radio (1.5%), and those who do not have any weather information (0.5%). The dominance of indigenous sources of weather activities is because most farming communities do not have access to electricity, which deprives them of gadgets like televisions and other electronic devices. Typical farmers in frontier basins like Lassin, Mbaw Nso, Nkuv, Gwarkang, Mbokam, Njanawa use mainly simple phones (for those who can a ord) that can be charged with a small solar panel. This partly accounts why such farmers resort more to indigenous sources of weather activities than scientific weather information. Furthermore, indigenous farmers reported at about 47% that the language of conventional weather forecasting is too complicated and hard for them to comprehend. They also asserted that the situation is made worse by the absence of local weather scientists (37%) to teach them weather changes for agricultural planning. The farmers also perceived that scientific weather reporting is faulty (9%), and hardly corresponds to the observed realities and communicates irregularly (7%). With these limitations of conventional weather sources, Bui farmers rely on community elders (45%), personal weather predictions (27%), local weather seers (24%), and friends and neighbors (3%). Community elders and local weather seers often invoke the gods of the rain through periodical incantations and traditional sacrifices. In Nso land, such traditional sacrifices are performed at the beginning of the planting season, where the gods are invoked for a good agricultural season, before the start of first weeding, harvest, and at the start of the farming season. The first sacrifice to invoke the gods of the land is performed by His Royal Highness the Fon of Nso. This is done at five shrines located at the palace in Kumbo, Mantum in Jakiri, the Kinsaan plunge pool in Kitiwum, the Mairin plunge pool in Takui, and the palace in Kovifem. After the fon's performance, other traditional leaders do the same in their respective areas of jurisdiction. Such sacrifices entail pouring libation (palm wine), pronouncing incantations and slaughtering goats and chickens, where their blood is sprinkled as sacrifice. The slaughtered chickens or goats are not edible by the indigenes or any other person. The carcasses are allowed in the open air to be devoured by vultures. Indigenous and local practices (ILP) are the result of the application of culture, context and location-specific knowledge to solve local problems. (...) Several variables were chosen in this study to express indigenous community knowledge for planning in the agro-hydrological systems of the Bui Plateau (Table 4). (...) With increasing variability in climate and uncertainty of first rains, most decisions made by indigenous farmers on the Bui Plateau are based on personal experience and conviction (72.2%). As risky as such decisions at the beginning of the planting may be, farmers perceive that the behavior of rains at the onset of the wet season gives them a clue as to how the rest of the growing season will unfold. Erratic nature of rainfall can cause misinformation and mislead farmers to make wrong decisions, given that the dry season is already gradually prolonged. Some signs such are mere smells (51.4%) that indigenous communities rely on to predict whether it going to rain or not at a time is still en vogue. Some people are gifted to predict the onset of first rains through weather smells, especially in the mornings of the months of February, March, and April. The sounds of some birds and insects is a common indigenous weather forecasting tool in many communities of the Bui Plateau (73.7%). One of such birds is the Senegalese Cowcow, which sings in the morning or anytime of the day to announce rains in about the next 10 to 60 min. On the other hand, the chattering of the Cameroon Mountain Francolin indicates good weather. Insects like crickets cackling at night is an indicator that there will be no rain. Another visible indicator of cessation of the wet season is swarms of dragon flies that fly eastwards from October to November. In the absence of conventional weather forecasting, farmers in the Bui Plateau are able to read weather signs through the behavior of some plants (49.6%). One of such plants is Scadaxus multifluros, which blossoms only once in a year in late February to early March. This plant has been used for generations in Kumbo-Jakiri-Wainamah, Nkum and Oku agrarian basins to read the weather about the onset of the first rains. Once it blooms, the rainy season will begin in about three weeks to one month. A farmer in Shisong armed that reading weather signs through the behavior of plants and animals was handed to him by his great grandfather. Indigenous knowledge handed down by forefathers from whom they acquired farming experience have had long standing and proven experience of weather forecast from which they have benefitted. From such experiences, farmers predict rainfall patterns through the farming season. During the dry season, indigenous communities of the Bui Plateau also study the yellowish reddish atmospheric aerosol loading to make informed decisions about their farming activities. Aerosol coloring of the atmosphere occurs mainly from December till the start of the wet season. This coloring indicates the appropriate time for farmers to start raising 'ankara' on farms. In the Dzeng-Tatum-Banten basin, raising ankara (a form of slash and burn) is through the burying of maize stalks for burning. In Mbam valley, ankara is practiced in newly opened fields and in old fields. Bush burning for agricultural activities, pasture regeneration, dry season dust storms are the main sources of local aerosol loading into the atmosphere on the Bui Plateau during the dry season. As from the month of February rain clouds (cumulo-nimbus) start building. Through the gathering of clouds (95.5%) such as a small alto-cumulus and strato-cumulus, community elders, weather seers, and people with experience in reading weather signs can predict the approximate date that the wet season will begin. Other indicators of indigenous weather forecasting include star constellation (60%), extreme temperatures (55.9%) and sequence of yearly weather events to determine what the climate would be in a farming season (42.9%). Dark clouds, according to indigenes signify approaching heavy rain."
6	Perceptions of climate variability and determinants of farmers' adaptation strategies in the highlands of Southwest Cameroon	Ngoe, M.; Zhou, L.; Mukete, B.; Enjema, M.	Applied Ecology and Environmental	2019	10.15666/aeer/1706_1504115054	"About 73.5%, 11.5% and 15% of the respondents had perceived an increase, decrease and no changes in temperature patterns. Similarly, 77.5%, 6.5% and 16% had perceived a decrease, an increase and no change in rainfall patterns respectively. Also, results showed 61.4%, 25.1% and 13.5% thought the number of rainy days had decreased, increased and had not changed (Table 3)."
6	Community perceptions of climate change and initiatives for the conservation of endemic plants in Limpopo Province, South Africa	Rankoana, S.A.	Weather	2019	10.1002/wea.3272	"The majority of the interviewees (98%) became aware of these changes between 1989 and 1997. The most common change reported was an increase in temperature, followed by rainfall scarcity. A conspicuous change in temperature was reported by the majority of participants (87%), who referred to their experiences of extremely hot summers and warmer winters. A similar proportion (86%) asserted that summers are now hotter and winters are warmer than they were ~20 years ago. (...) There was a general perception amongst participants of a reduction in rainfall. Almost all of the interviewees (98%) described observations of changing rainfall patterns, noting that there has been a reduction in rainfall during the rainy season. A large number of those interviewed (83%) asserted that the last time they experienced a 'good' rain was about 18 years ago. Many (70%) recalled incidences of winter precipitation, and such episodes are attributed to warmer winters. Almost three-quarters of the sample (74%) stated that they usually expect rain to arrive around September–November, but in recent years the first rain has not arrived until December or January. Some also reported that recent rainfall has been accompanied by thunderstorms. (...) Participants reported that cultural activities which depend on rainfall, such as subsistence farming, the collection of wood for fuel, livestock farming, and the performance of rain rituals, are not practised any more. (...) Almost all of those interviewed (97%) mentioned that, in addition to the negative effects of deforestation and overharvesting, the increased temperature has negatively affected the growth of local vegetation (Figure 2). Many species of tree and shrub are failing to grow to their full extent, and the recovery of overused species has been harmed by the increase in temperatures and rainfall scarcity. Furthermore, 85% of participants asserted that the indigenous plants harvested for fuel and food (Table 1) are becoming scarce due to poor growth caused by excessive heat. Many interviewees also noted that they had witnessed immature plants dying off before they reach maturity. Three-quarters (75%) of participants added that the sustainability of the remaining species has been diminished by the temperature increases."

10	Farmers' Perceptions of Climate Change Trends and Adaptation Strategies in Semiarid Highlands of Eastern Tigray, Northern Ethiopia	Kahsay, H.T.; Guta, D.D.; Birhanu, B.S.; Gidey, T.G.; Routray, J.K.	Advances in Meteorology	2019	10.1155/2019/3849210	"Households had no wide perception in climate change, and an undeniable majority of households perceived a notable change in rainfall and temperature. Out of the total households, 98.56% and 92% perceived a decrease in rainfall amount in Hawzen and Irob, respectively. The $\chi 2$ test was employed to determine whether there were differences be_x0002_tween the household groups in their perception behaviors. A significant difference was found ($\chi 2$ test, $p < 0.01$), indicating that households who had been in Hawzen were more likely to perceive a decrease in rainfall compared to those in Irob. Besides to perceiving the decreased rainfall in the study area, almost 40 percent and 20 percent of households believed that variability in onset and cessation time of rainfall is more in the last 15 years, respectively. Furthermore, around 29 percent and 39 percent of households in the Hawzen and Irob districts noted that the number of rainy days decreased; that is, there was no rain for a full month within the rainy season. Nonetheless, few households suggested that even when it rains, the intensity of rainfall is increased. Only 5 percent of households from Hawzen observed abnormality in rainfall timing, and dis_x0002_tribution was increased. Furthermore, almost 37 percent of households in Irob understood that the occurrence of drought frequency was increased, while only 2.4 percent viewed contrarily to this opinion in Hawzen. Regarding rainfall patterns of the last summer, around 82 and 92 percent of households from Hawzen and 99 and 98 percent of house_x0002_holds from Irob report that rainfall came too late and stoped too early, respectively. In addition, around 25 percent of households in Hawzen witnessed rain during the harvest time last year. 'is inadequacy of rainfall and unreliability of raining time impede the agricultural planning that attracts appropriate adaptation strategies and reliable scientific climate information to mitigate the climatic shocks. Moreover, 87 and 90 percent of households felt that tem_x0002_perature increased, while about 3 and 8 percent believed that temperature decreased in the last 15 years in Hawzen and Irob, respectively. The significance ($\chi 2$ test, $p < 0.001$) showed that households who had been in Irob were more likely to perceive an increase in temperature compared to those in Hawzen. Furthermore, about 77 and 78 percent of households perceived an increase in hot days, while 7 and 5 percent noted the decrease of coldness in cold seasons, respectively. Generally, the majority of households are aware about the presence of climate change and variability. 'ey revealed their local experience of climate change and vari_x0002_ability using variability in onset and cessation time of the rainy season, the decreased number of rainy days, a raise of drought severity, and the increased number of hot days. (...) The majority of farmers believed total rainfall decreased in the last fifteen years in their localities (Table 2)."
10	Smallholder farmers' perceptions and adaptive response to climate variability and climate change in southern rural Ghana	Yamba, S.; Appiah, D.O.; Siaw , L.P.	Cogent Social Sciences	2019	10.1080/23311886.2019.1646626	"Majority of the respondents indicated that the local climate has become capricious manifest in increased temperature, variable rainfall pattern and increased incidence of flooding (Figure 4). When asked about the pattern of change in rainfall observed, majority of the respondents said the rainfall frequency had increased (67% of response) while its intensity has decreased (79% response). About 91% believed that rainfall had become inconsistent and unpredictable while 9% believed that the rains were consistent and predictable. (...) When questioned about their views on temperature, more than three quarters of the respondents (87%) indicated that temperature has been increasing in the last 10 years while 13% said otherwise. (...) Again, 77% claimed that the incidence of flooding had increased whereas 10% and 13%, respectively, said it had decreased and remained the same (not noticed any change). (...) Consequently, 71%, 84% and 84% perceived an increase in the incidence of drought, crop pests and diseases, and flooding, respectively, while 29%, 16% and 16%, respectively, said that these incidences were normal. (...) The effect of these human activities was generally seen as not having a direct impact on climate as 18%, 25%, and 26% respective said smoke emission of (vehicles, burning of tyres, and firewood) and industrial emissions do not affect climate. A majority of respondents (61%) however said that deforestation contributes to climate change. (...) About 83% acknowledged that land use patterns affect weather explaining that forest cover has been lost to agricultural land use and eventually residential in parts of the district. This has led to stronger winds with greater impact on farms and property. Respondents also indicated that land cover influences temperatures, explaining that forested areas are less warm compared with places with little or no forest cover. (...) As high as 92%, 99% and 80% of respondents, respectively, held that forest serves as watersheds, prevents intense surface heating and also creates favourable local climate. Also, 38% and 32% said that forest/vegetation have benefits of enhancing cloud formation (hence rainfall) and sequesters carbon dioxide, respectively (Figure 5). (...) The study further revealed that local perception of human-induced climate change is quite high (63% as against 37%). This reflected in a generally high affirmative response for the question "is human cause of climate variability and climate change prominent" observed across all levels of education (Table 4)."
6	Climate change perceptions and adaptive actions by pastoral community on the Tibetan plateau, China	Sharif, J.; Rafiq, M.K.; Rafiq, M.T.; Aziz, R.; Qayyum, A.; Saleem, A.R.; Nisa, W.U.; Jenks, M.A.; Li, Y.	Applied Ecology and Environmental Research	2019	10.15666/aer/1704_79878009	"Responding to the question whether they know about climate change or not. 83.3% of the respondents belonging to Daiqian village were aware of the climate change issues while about 16.7% of the respondents were not aware of the climate change phenomenon at all. As compared to Daiqian, the pastoral community of the Dawu was less aware of the climate change. However majority of the respondents of Dawu village 75% had the knowledge about climate change while 25% did not have awareness about climate change (Table 6). Majority of the respondents 72.5% in Dawu village were having a personal experience to judge the climate change issue while only 30% in Daiqian village have examined the climate change through personal observations (Table 7). The other factor contributing in the development of climate change awareness among pastoralist included Government Departments, weather forecast program, TV programs and multiple sources. Weather forecast program and TV program jointly contributed in developing perception among 13 (43%) and 16 (40%) of the respondents in Daiqian and Dawu respectively. (...) Figure 6 shows, in Daiqian village, most of the participants (18%) perceived changes in climate in the form of rise in annual temperatures in the area ($p = .043$) while 29% of the respondents perceived changes in climate in the form of low rainfall and rainfall variations ($p = .000$). The other perceived negative impacts of climate change in Daiqian were low production of the grasslands (12.5%), poor animal health (15%) and death of animals (12.5%) (= .000). On the other side, 17.5 and 15% ($p = .000$) of the respondent in Dawu village increase in temperature and lower rainfall distribution respectively (Fig. 6)."
6	Climate change perception and adaptation in Nigeria's guinea savanna: Empirical evidence from farmers in nasarawa state, Nigeria	Tarfa, P.Y.; Ayuba, H.K.; Onyeneke, R.U.; Idris, N.; Nwajiuba, C.A.;	Applied Ecology and Environmental	2019	10.15666/aer/1703_70857112	"The result indicates that most farmers (76.25%) perceived that long-term temperature is increasing. (...) Most of the farmers (77.50%) averred that rainfall in the area is reducing in aggregate volume (Table 3)."
10	Role of traditional ecological knowledge and seasonal calendars in the context of climate change: A case study from China	Yang, H.; Ranjitkar, S.; Zhai, D.; Zhong, M.; Goldberg, S.D.; Salim, M.A.;	Sustainability (Switzerland)	2019	10.3390/SU11123243	"During our field survey, local people noted the winter warming and increased rainfall in summer compared with those in past years. Long-term meteorological data is therefore correlated with local perceptions of climate, revealing an increase in late autumn and winter temperatures (Figure 2a). Winter warming might lead to the decreasing length of snow reason in winter, as mentioned by locals. The significant increase in rainfall during August was consistent with the perception of locals. Besides, locals also detected an increasing pattern of rainfall in June (Figure 2b)."
2	Climate change effects on crop production in Yatta sub-County: Farmer perceptions and adaptation strategies	Agesa, B.L.; Onyango, C.M.; Kathumo, V.M.; Onwonga, R.N.; Karuku, G.N.	African Journal of Food, Agriculture, Nutrition and Development	2019	10.18697/AJFAND.84.BLFB1017	"The majority of farmers in Yatta sub-county were aware of climate change (Table 2) with 50% of farmers interviewed reporting erratic and low rainfall, 33% droughts, and 14% reported rising temperatures as the main evidence of climate change observed in both wards (Fig. 2). A small number (3%) identified other indicators which included floods and cold spells as evidence of a changing climate, an indication that these were not common occurrences in the region. The farmers also observed that these changes have been evident throughout the past decade with changes in rainfall being more pronounced longer than 10 years ago. (...) The main source of information on climate for the farmers in Yatta sub-County was through extension officers (72%) with most of the farmers identifying more than one source of information (Table 3). They also relied on friends, the radio, their own knowledge from years of farming and information passed down through generations, newspapers, seminars and meetings. Respondents identified deforestation as the main cause of climate change (Fig 4). Other causes of climate change identified were, industrial pollution as well as agricultural activities such as use of fertilizers and clearing of vegetation cover for agricultural land. However, some respondents (12%) did not know the causes of climate change despite acknowledging that the climate is changing."

6	Local ecological knowledge on climate change and ecosystem-based adaptation strategies promote resilience in the Middle Zambezi Biosphere Reserve, Zimbabwe	Kupika, O.L.; Gandiwa, E.; Nhamo, G.; Kativu, S.	Scientifica	2019	10.1155/2019/3069254	"Findings from key informant interviews indicated a general awareness among the village elders and other community leaderships that climate change and variability have been a reality in the area. One of the key informants who had stayed in Chundu Communal Area for over five decades (50 years) had this to say: "I was born in this place in 1965 and my parents were also born here. Yes, I have heard of climate change. I can witness that the climate is changing judging from the shifting rainfall patterns, it is increasingly becoming erratic and local spirit mediums have advised that rainfall will decrease. We have observed it to be true and even the radio confirms this notion about declining and erratic rainfall." Perceptions of key informants are similar to about 58.1% (n = 186) of household questionnaire respondents who indicated that they were aware of climate change whilst 41.9% (n = 134) were not aware. (...) Focus group discussions further revealed that, in the study area, rainfall has been generally decreasing whilst temperature has been increasing. Key informants and FGD participants expressed concern that while the rainfall amount has been generally decreasing, the seasonal distribution of the rainfall was not even throughout the growing seasons. Results from the household survey show that the majority (88.1%; n = 282) of the respondents perceived that the rainfall amount was generally decreasing whilst temperatures were increasing (68.1%; n = 218) (Figure 2). Respondents showed mixed perceptions on temperature trends with 68.1% (n = 218) of the respondents perceiving an increase, 8.1% (n = 26) perceiving a decline, and 23.8% (n = 76) perceiving that temperatures had remained the same (P = 0.02) (Figure 3). +e mean response was 1.40. On the other hand, no significant differences were observed on perceptions on rainfall with 4.4% (n = 14) of the respondents perceiving an increase, 88.4% (n = 282) perceiving a decline, and 6.9% (n = 22) perceiving that temperatures had remained the same (P = 0.03). The mean response was 2.83. Findings from key informants and FGDs indicate that there has been a shift in the onset of rain season from October to mid-December whilst the end of rainy season has shifted from March to April since 2013. Traditional leadership noted that the community used to receive early rain like "bumharutsva" and "gukurahundi" prior to the onset of the rain season in November.+e majority of key informants indicated that the onset of the rain season had shifted and was now shorter whilst the amount of rainfall has been declining. One key informant stated "Rains are no longer coming in November but mid-December and end in early March. In the past, we used to get rainfall from October/November until around March/April. Overall, the length of the rain seasons has also decreased we only get rainfall for just two months or even one month. From 1982, we have been receiving normal rainfall except for 1992, 2001 and 2008 when we experienced severe drought. From 2008 up to now it has drastically decreased." A large proportion of the household respondents (94.4%; n = 302) perceived that they had experienced drought as the most frequent extreme event followed by extreme heat (74.7%; n = 239) (Figure 3). Key informants and FGD participants also confirmed that there have been changes in rainfall amount and temperature. One key informant stated "2015/16 summer season has been the worst in terms of excessive heat. +ere were 2 days on a weekend that were the hottest ones we have ever seen. On those same days, our soya bean crops actually dried up within hours from the excessive heat. I think that temperatures at that time were over 40°C. On the other hand, we also experienced extremely cold periods in winter." A large proportion (94%; n = 302) of the household respondents had experienced drought. Respondents showed mixed perceptions on the frequency of occurrence of drought with 61.6% (n = 197) of the respondents perceiving an increase, 14% (n = 45) perceiving a decline, and 24.4% (n = 78) perceiving that temperatures had remained the same (P = 0.01). On the other hand, no significant differences were observed on perceptions on excessive heat and excessive cold (P = 0.07). Key informants and FGD participants mentioned that the area had experienced droughts during the following years: 1981/82; 91/92; 87/88; 2001/02; 2007/8; 2013/14. Approximately half of the household respondents (56%; n=178) stated that they had experienced extreme cold winters since 2008. Trends in the occurrence of cold winters were also perceived to be on the increase (48/8%; n = 156), and the severity was moderate (43.4%; n = 139). FGD participants also stated that, during the 2012/13 and 2014/2015 rain season, the area had received unusual hailstorms associated with destructive winds. However, findings from the household survey show that floods (3.8%; n = 12) and tropical cyclones (10%; n = 32) are not a common event in the area. All the key informants and FGD participants concurred that generally, weather conditions had become drier and rainfall timing was becoming more unpredictable. Key informants were of the opinion that climate change is caused by industrial pollutants and the abandonment of traditional culture and practices. Traditional leaders noted that local chiefs generally no longer perform the traditional rainmaking ceremonies. It was reported that the chiefs could not perform the ceremonies because they do not qualify since these days people use various deviant acts to become chiefs. One key informant stated "Back in the days when industries were few, we had no issues of climate change. e spirit mediums tell us that in terms of lifestyle, people used to be well behaved long ago and there were no cases of incest. Bereaved families did not store or hang up dead peoples' clothes (kuturika matata) like what people are doing nowadays. The ancestors are angered by these sins and in turn do not bless the area with rainfall." (...) Generally, all key informants stated that climate change is caused by excessive deforestation whilst other thought it is due to natural causes. Those who mentioned deforestation attributed this to clearance of land and wood harvesting for tobacco farming and curing, respectively. (...) Household respondents, key informants, and focus group discussants were aware of the impacts of climate change on socioeconomic and biophysical components of the environment (Table 3)."
2	Climate change impact on quality of life indicators of pastoralists (case study: Rangelands of Haraz River Basin, Mazandaran province, Iran)	Kavianpoor, A.H.; Barani, H.; Sepehri, A.; Bahremand, A.; Moradi, H.R.	Journal of Rangeland Science	2019		"Most of pastoralists (90.7% in Baladeh and 87% in Larijan) believed that climate changes have happened in HRB (Table 3). There was strong convergence between perspectives of the two pastoral groups about climate changes for annual rainfall and temperature (Tables 4 and 5). They believed that the number of rainy days decreased in all seasons. Amount of rain in autumn and spring and average annual precipitation decreased. But their opinions showed short and erratic rain in spring and summer seasons increased (Table 4). Also, their ideas indicated that the night temperatures decreased in spring and summer. But their opinions showed spring and summer temperature and average annual temperature increased (Table 5). (...) The results showed that Baladeh pastoralists believed that climate changes had the highest impact on water quantity, migration, job insecurity, future expectancy and social conflicts with coefficient of variation of 0.207, 0.22, 0.297, 0.299 and 0.30, respectively with negative impact (Table 9). Larijan pastoralists believed that climate changes had the highest impact on migration, water quantity, future expectancy, social conflicts and job insecurity respectively with coefficient of variation of 0.26, 0.263, 0.277, 0.29 and 0.323, respectively with negative impact (Table 9)."
6	Local perceptions and adaptation of indigenous communities to climate change: Evidences from high mountain pangi valley of Indian himalayas	Meena, R.K.; Vikas; Verma, T.P.; Yadav, R.P.; Mahapatra, S.K.; Surya, J.N.; Singh, D.; Singh, S.K.	Indian Journal of Traditional Knowledge	2019		"Most of the respondents perceived climate change through various associated changes experienced during the period 2000-2015 compared to 1985-2000 period. More than 90% of the respondents in the valley had perceived climate change in the form of decreased snowfall (98.3%), temperature rise (97.5%) and late onset of monsoon (91%) over the past period (Fig. 2). The respondents expounded that snowfall of 5-15 ft (1.5-4.5 m) was a regular phenomenon before 2000 in the peak months of snowfall (i.e. January-March) but now it reduced to 2-8 ft (0.5 -2.4 m) , depending up on the elevation in the valley. A respondent from Shunn village in the valley reported that snowfall in February-March now is similar to that of earlier snowfall in November- December. Majority of the respondents believed that rainfall is decreasing (76.7%) over the years. More than half of the respondents viewed that long dry spell (60%), more intense rainfall (59.2), decreased number of cloudy days (57.5%) and stronger wind (55.8%) as result of climatic change. About 32.5% and 28% of the respondents said that snowfall timing delayed and early withdrawal of monsoon, respectively. Respondents believed that climatic events became unpredictable over the years. (...) Among the seasons, the respondents opined that summer season (95.8%) and winter season (82.5%) are getting hotter (Fig. 3). Moreover, 91.7% of the respondents believed that winter period is reducing while about 72.5% respondents said that summer period becomes longer than previous years. The decreased snowfall and increased temperature led to reduced winter period and longer summer over the studied period. (...) About 85.8% of the respondents said that drought incidence has increased over the period due to decreased and uncertain precipitation (rainfall+snowfall) pattern and temperature rise. The respondents observed decreased flow of snow-melted water/glacier runoff (86.7%) and avalanches (80.8%) in the valley. (...) About 45% of respondents believed that landslides have decreased over the years and rests of them were disagreed with any changes occurrence of this event. This might be due to decreased rainfall, reduced snowfall and its fast disappearance led to decrease in moisture content in soil. In addition to this, intense rainfall and steep slope provide short residence time for water percolation and, hence less-favorable condition for initiation of landslides. Further, more than one-fourth of the respondents were of opinion that number of cloudburst had increased while others decline the occurrence of phenomena."
26	Vulnerability to climate change of smallholder farmers in the Hamadan province, Iran	Jamshidi, O.; Asadi, A.; Kalantari, K.; Azadi, H.; Scheffran, J.	Climate Risk Management	2019	10.1016/j.crm.2018.06.002	"In this study participants answered three questions about their personal views and perceptions about climate change. For the first question, a substantial majority of respondents (71%) indicated that they believe climate change is occurring while 8.2% do not believe it is occurring. Also, 20.7% of the respondents mentioned that they don't know if the climate change is occurring or not. The majority of the interviewed respondents had observed an increase in summer temperature in the last 30 years and they had the opinion of increasing temperature of winter as well. Based on the results, about 85% of the respondents believed that precipitation and water resources availability in the region have declined over time and extreme climatic events like droughts has increased accordingly, about one third of them acclaimed that flooding and frostbite has decreased over last 30 years (Table 3). Farmers appear to be relatively aware of the causes of climate change. About 30.2% of respondents believed that climate change is caused mostly by human activities. 19.5% pointed out natural process is responsible for climate change, while 20.7% of them acclaimed that climate change is caused equally by natural process and human activities. Also, about one third of the respondents were unaware about the cause. According to only 10.7% of the respondents, climate change problems can be mitigated and it is completely possible, while 35.3% of them confirmed that climate change impact can be reduced with great efforts. Also, about 21.7% remaining believed that it is impossible at all to mitigate climate change and 32.3% didn't know about that.

1	Perceptions of climate and climate change by Amazonian communities	Funatsu, B.M.; Dubreuil, V.; Racape, A.; Debortoli, N.S.; Nasuti, S.; Le Tourneau, F.M.	Global Environmental Change-Human And Policy Dimensions	2019	10.1016/j.gloenvcha.2019.05.007	"The outcome variables reveal an overwhelming perception of climate change in general (□72%) and of rainfall changes (□65%). Other elements of climate (winds, temperature and humidity) were also brought up spontaneously (12.7%), with increased temperature being often mentioned (11.3% of total answers). (...) For the "Why is the weather changing" question, 30.8% of respondents felt that there exists an anthropogenic imprint through deforestation, dam building, degradation of soil and environment (pollution, silting). For other factors such as fire, cattle ranching and road construction, 14.7% of the interviewees suggested that climate is "not changing", "God is changing it", or "climate is evolving naturally". (...). On the other hand, respondents in the community of Iratapuru often brought up the construction of the Belo Monte hydro-electrical power plant (to which they are strongly opposed) as the reason for climate change. (...) For example, Fig. 3 shows that perceptions of rainy/dry season changes (question (i)) are clearly heterogeneous across sites: six sites (Chico Mendes, Oyapock, Parauapebas, Ouro Preto do Oeste, Mamiraua, Juína and Tupé) presented a 40% or higher rate of changes in both rainy and dry seasons. To a lesser degree, this response was seen in populations in Moikarako, Sorriso and Iratapuru (33%, 21% and 24% respectively). In the latter sites, the strongest response was that changes in climate have been neither observed nor felt (49%, 29%, and 43%, respectively). Finally, only two sites reported a higher rate of perception of changes in the rainy season only, namely Ciriaco (37%) and to a lesser degree Carlinda. (...) The most frequent answers point to a decreasing frequency in rainfall (14.8%), an increase in both the intensity (11.2%) and unpredictability (14.3%). On average, 10.2% perceive a displacement of either the beginning or the end of the rainy season. However, an equivalent proportion of the population (9.9%) did not observe any changes in precipitation patterns. (...) The displacement of the rainy season is a striking perception despite not being the most mentioned. Certain sites referred to the displacement of the rainy season more than others (Fig. 5), for example Ciriaco at above 34%, PAE Chico Mendes at 18%, and more than 10% in Juína, Oyapock, Moikarako, and Sorriso. The spatial distribution of these responses shows that it is more perceived in the south, but there is no apparent link with the type of activity (agribusiness, traditional or indigenous). (...) We found no significant correlation between rainfall trends and any perception (Table 8), nor between the magnitude or amplitude of interannual variability and perceptions of rainfall changes (not shown). (...) The communities of Oyapock, Iratapuru, Tupé and PAE Chico Mendes (in the north and western parts of the domain) present notions of increasing trends in precipitation, in volume or intensity, or both. These perceptions do not match trends based on rainfall observations. In Mamiraua, no trends in rainfall frequency or intensity were perceived, while a slight increase in rain frequency has been detected. Ouro Preto do Oeste, Juína and Carlinda (in the southern part) showed perceptions of decreasing rainfall. A rather consistent match between perception and observations appears for the sites of Sorriso (no trends overall), Juína and Carlinda (less rainfall). Sites located in the eastern Amazon (Anapu, Ciriaco, Parauapebas, Moikarako) show strong disparity between perceptions and measurement-based estimates regarding both intensity and total rainfall trends. Finally, the unpredictability of rainfall is mentioned by nearly all interviewees, albeit in different degrees. Oyapock and Mamiraua are the sites in which this aspect was the most strongly mentioned (37.0 and 31.6%, respectively), followed by Ouro Preto do Oeste (22.8%) and PAE Chico Mendes (24.5%)."
1	Adapting to changing climate through improving adaptive capacity at the local level - The case of smallholder horticultural producers in Ghana	Williams, P.A;. Crespo, O.; Abu, M.	Climate Risk Management	2019	10.1016/j.crm.2018.12.004	"Smallholder horticultural farmers also mainly experienced climatic changes in the past 10 years (Table 1). Almost all farmers in Keta (100.0%) and Nsawam (99.0%) perceived an increase in temperature. Majority of the farmers also perceived mainly a decrease in rainfall duration and quantity over the period. Few of the farmers perceived a moderate increase in rainfall duration (33.0%) especially for Nsawam. The perception of rainfall reduction is often related to the perceived increase in drought occurrence with 95.0% of responses in Keta and 93% in Nsawam agreeing to this. Perception of flooding in terms of volume and damage to farmlands was mostly mixed, with marginal majority perceiving decrease. Few of the farmers were indifferent (constant) about changes in flood occurrence. Two-thirds of respondents in Keta perceive that, water sources for production activities has increased, unlike farmers in Nsawam whom mostly perceived decrease. Generally, farmers perceived patterns of rainfall and temperature change shows farmers are conscious of the changing climate. (...) Majority of the farmers in both municipalities strongly agreed to climate having such impacts on their livelihoods. Focus Group Discussions with farmers' highlighted evidences of climate variability such as erratic rainfall pattern usually unpredictable and increasing temperature affecting various crop growth stages and resulting in yield losses and poor quality produce. (...) The FGDs further highlighted that horticultural farmers in both study areas are already experiencing the impacts from changing climate. According to the farmers, increasing temperature and variation in rainfall quantity and duration result in dehydration, leaf scorches, increase in pest and diseases, variation in fruit maturity and abnormal fruit set with occasional fruit set failure for most horticultural crops which negatively affects productivity."
1	Climate change in Lamjung District, Nepal: meteorological evidence, community perceptions, and responses	Joshi, A.; Farquhar, S.; Assareh, N.; Dahlet, L.; Landahl, E.	Environmental Research Communications	2019	10.1088/2515-7620/ab1762	"Ethnographic research revealed valuable perceptions on changing climatic parameters (figures 10–13). The majority of respondents (90%) reported that there was an increase in erratic rainfall frequency, but a decrease in the frequency of rain overall (65%) (figure 10). (...) As for people's perceptions on climatic disaster frequencies (figure 11), most of the respondents mentioned that there was an increase in flood (80%), drought (80%), and off-season rain frequencies (60%), as well as hailstorm frequency (80%). Regarding the changes in summer temperature (figure 12), 55% of respondents replied there had been an increase. Furthermore, all respondents reported experiencing decrease in agricultural harvest (100%), biodiversity (68%), and forest products (65%) (figure 13).
1	Resilience to climate variability: the role of perceptions and traditional knowledge in the Colombian Andes	Vargas, C.A.C.; Romero, S.H.; Leon-Sicard, O.	Agroecology And Sustainable Food Systems	2019	10.1080/21683565.2019.1649782	"All peasants included in this research perceived significant changes in climate variability in recent years. These perceptions come from their everyday experiences, as well as from the information they receive from mass media. The following table presents the results obtained when the peasants were asked to mention the main causes of climate variability (one person could mention one or several causes). Most of the causes were related to anthropogenic activities: deforestation, pollution and fire. Peasants also associate these actions with the environmental deterioration of the region, which is an indicator of their empirical knowledge about the effects of human activity on climate change. 74% of respondents evidenced some form of power asymmetry as the cause of climate variability: they associated deforestation with the policies promoted by the 'elites' and implemented by the FNC since the 1970s. These policies favoured monoculture, resulting in a reduction of agrobiodiversity as well as food security in rural communities. Others made an explicit distinction between the rational use of wood made by peasants and the exploitative use performed by big companies. This is also the case of pollution, which they attribute to rich countries' modes of production, large industry and multinationals, that exploit resources, make profit, pollute and then leave without restoring ecosystems or providing any aid to the locals. (...) At the same time, 54% agree that although there is a degree of responsibility on the part of the peasants in terms of deforestation, they are not the main cause of the problem. They argue that they make rational use of resources, promoting and conserving biodiversity in multiple ways, especially in the case of organic producers. Of the 72.6% that identify pollution as one of the causes, barely 33% recognizes industrialization processes and high levels of consumption in developed countries as one of the main causes of greenhouse gas emissions. (...) Although a high percentage of peasants recognize some form of power relationship as a cause of climate variability, they have been normalized in such a way that it is considered that, although power relations are unjust, they are unalterable. It is also interesting to find that divine reasons are pointed out as one of the causes of climate change. Even though it is a small percentage (10.5%), it reflects how the cultural and symbolic context determines the perceptions with respect to environmental phenomena. The colonial heritage and the influence of Catholicism in the Tequendama region (where this municipality is located) may explain the prevalence of religious aspects in the way of knowing and explaining the world and climate phenomena. This is also related to the limited access to scientific information, since only 3% of the participants have received any kind of training in the subject. (...) It is noteworthy that only 7.8% (a lower percentage in comparison to the divine reasons) attributes climate variability to conventional agriculture. (...) Most of the effects of climate variability reported by farmers are negative. (...) 100% of Anolaima peasants report that the periodicity of the rains has changed over time. There are two periods in the year when rainfall increases (between March and May, and between October and November), and another period in the middle of the year when it decreases.(...) 93% of the peasants perceive that in the last 10 years there has been greater intensity of both rainfall and solar radiation."

1	Explaining the uncertainty: understanding small-scale farmers' cultural beliefs and reasoning of drought causes in Gaza Province, Southern Mozambique	Salite, D.	Agriculture And Human Values	2019	10.1007/s10460-019-09928-z	"Responses showed that participants have a limited knowledge and understanding of the scientific explanation for drought and climate change, and they mostly began to hear about it during the last drought (2014–2016) via the radio and announcements by local authorities at their general community meetings. Most of the participants are illiterate (36.5%), 79.5% of them being women, or have only attended primary school (52.5%), which is why many are unfamiliar with the scientific explanations for drought. On the one hand, these illiterate participants related climate change to changes in their socio-cultural environment by giving examples of the current behaviour of young people, which is dissimilar to the past. Participants asserted that nowadays young people are disrespectful to adults and have children when they are around 12 years old. On the other hand, participants related drought to the El Niño phenomenon, a warming of the sea surface temperature, which causes drought in Southern Africa and other parts of the world. However, because participants only heard about El Niño during the last drought, they struggled to pronounce the name and referred to El Niño as aluminum (due to the similar pronunciation in Portuguese), an ice stone or an animal which is in the ocean blocking the rain, asserting that it will rain when the animal dies. The young people (16–24-year old), who have more access to education up to lower secondary school, were the ones who tended to talk about drought-related scientific information as part of their own knowledge. For example, young people mostly mentioned about the impacts of their activities on the changes in weather and climate, such as cutting down trees and burning them to clean fields, grow crops or produce charcoal. Despite such explanations, these young participants claimed that there was nothing they could do since they depend on their activities for their livelihoods and survival. (...) Conversely, the majority of farmers (63.5%) hold a variety of cultural beliefs about the causes of drought that range from indigenous to Christian, which can sometimes be exclusive, or a mixture of both types of beliefs as a result of their uncertainty of the causes. There were also some farmers who were unsure (9%), or claimed not to know what could be the possible causes of drought (23.5%). Some farmers also showed shifting beliefs, voluntarily or involuntarily, as a result of perceived social group pressure. In both study sites, 51% of the individual farmers who were surveyed stated that drought is caused by God, while this was mentioned by 5 out of 25 FGDs (Chibuto only) (see Table 1). (...) The most predominant argument in both the individual questionnaires and the FGDs was that God created nature and also controls it. Since the rain comes from the sky, God is the only one who has the power to stop it and to decide when it should or should not rain. This is why we pray to Him and ask for the rain and for other needs. (...) The sovereignty of God was even recognised by almost half of 27.5% non-Christian people. Yet, when asked why then they think God, with his omnipotence, is stopping the rain, their justifications were vague. Individually, the majority of them did not know the underlying reasons, they just knew that it was God because of his omnipotence. Others argued in vague terms that God simply forgot about them, or gave up on them for some unknown reason or for sins they believed they might have unsconsciously committed. Similar responses were given by the FGD. However, two individual farmers and one FGD from Chibuto seemed to have a different answer to the others, which was found after analysing what was going on in the country. A 48 years old female farmer who attends the Methodist church concluded that: “since it is not possible to rain everywhere at the same time, God was being fair to everyone by giving, at times of drought, rain to other zones, before giving rain to our zone”. Consistent with findings from Robinson (2009, p. 62), the other farmer, a 65 year old non-Christian man, believed that: “God was causing drought because of the war in the country.” (...) Conversely, a group of over-45 years old women recognized that everyone was guilty of causing the punishment for being ungrateful, of not thanking God for the good harvest that they have when he sends rain, and thanking their ancestors instead. (...) Although drought as a punishment from ancestors was less prevalent in terms of individual beliefs (12.5%), when compared to group beliefs (100%), participants believed their ancestors were punishing them with drought for not following and respecting their customs as in the past. (...) Participants provided a variety of justifications about why they have not been following and respecting tradition (see Table 2 for complete explanations), which were categorized into four groups: failure to undertake rituals correctly; unnecessary abortion; unburied dead bodies; and witchcraft. It was noted that individuals’ indigenous drought beliefs were mostly verified among those non-religious participants who had little (primary school) or no education."
26	The perception of climate change: Comparative evidence from the small-island societies of Bougainville and Palawan	Pondorfer, A.	Environmental Development	2019	10.1016/j.envdev.2019.04.002	"Turning to respondent awareness of climate change, Fig. 2 shows the percentages of respondents that have heard about climate change for the Palawan and the Teop respectively as compared to those that have not heard of climate change. Across societies, Teop people are more aware of climate change than Palawan people. About 89.8% of the Teop people have heard about climate change, compared to 68.3% of the Palawan. This difference is statistically significant ($p < 0.001$). (...) Focusing on the results of the pooled model, the regression results confirm our earlier results based on descriptive statistics; significant differences in awareness exist between the two societies even when we control for other factors. The coefficient of Society is positive and statistically significant indicating that Teop people are more aware about climate change than Palawan people. Education, age, access to information and market integration are positive and statistically significant predictors of climate change awareness. In our case, education perfectly predicts climate change awareness for the sub-sample of Teop. The results show that the probability to hear about climate change is increasing with an individual's education level, age and connectivity. On the society level (columns 2 and 3) we confirm that education and market integration are important factors that influence awareness. The coefficients are larger in Teop than in Palawan but the level of significance is also lower. Access to information is statistically significant and of considerable size in Palawan but negative and insignificant in Teop. Moreover, vulnerability (weakly) predicts awareness of climate change in Teop but is negative and statistically not significant in Palawan. Overall, these results suggest that factors like education and market integration have a positive effect on awareness in both societies but the extent of the effect differs across societies. In contrast, access to information seems to be more society-specific while vulnerability has no effect at all. (...) We find significant differences in reported causes with respect to divinity and nature, respectively. About 13.6% of Teop respondents believe that climate change is the will of god compared to 35.9% of Palawan respondents. In contrast, 42.0% of Teop people think climate change is a natural process compared to 17.2% of Palawan people. These differences are statistically significant (for god's will, $p < 0.001$, for nature, $p < 0.001$). With respect to pollution, reported responses are identical across societies ($p=1.00$). About 44.3% of Teop and 46.9% of Palawan people state that pollution causes climate change, respectively.
3	Perceived Climate Change Impacts and Adaptation Strategy of Indigenous Community (Chepangs) in Rural Mid-hills of Nepal	Khanal, P.; Wagle, B. H.; Upadhaya, S.; Ghimire, P.; Acharya, S	Forestry: Journal of Institute of Forestry, Nepal	2019	10.3126/forestry.v16i0.28353	"It was found that majority of the Chepangs were not familiar with the term "climate change", and only 30% respondents were familiar with it. These limited people within the Chepang community aware of climate change, are the major source of information for the wider communication. Although these limited people knew the term 'climate change,' the majority of the Chepang community were found to have observed changes in temperature and rainfall patterns over the years. (...) Similarly, 77% respondents perceived that they experienced an increase in summer temperature whereas 23% observed no change, and it was as before. Similarly, more than 46% respondents observed cooler winter compared to earlier years (Figure 3).(...) More than 84% respondents reported that they had experienced variability in rainfall while the rest did not observe any change. Majority of them (74%) observed an increase in rainfall. They also reported that the summer rainfall had increased (Figure 4).(...) Although, the majority of the respondents observed variability in annual rainfall, there was great variation in responses regarding starting time of monsoon rainfall. Nearly half (46%) of the respondents observed late rainfall, while 34% respondents observed no change, few of them (13%) observed early rainfall and very few (7%) observed variation in rainfall starting period.(...) The study showed that Chepang community perceived increase in human disease as the major impacts of climate change followed by animal disease, weather-related disaster, physical loss, decrease in agricultural production, increase in crop disease/insect infestation, decrease in water resources and decrease in forest fire (Table 2).(...) Climatic hazards were perceived as the major impacts of climate change by the majority of respondents. We grouped climatic hazards into floods, thunderstorm, hailstorm, intense rainstorm, drought and landslide. 94% respondents reported an increase in climatic hazards. Among them, landslide was the top one followed by drought, flood, hailstorm and intense rainstorm."
3	Effects of Climate Change on Tropical Forest Ecosystem of Three Selected Local Government in Rivers State, Nigeria	Nnadi, P. C.; Amadi, G. O.	Journal of Applied Sciences and Environmental	2019	10.4314/jasem.v23i1.13	"On climate change awareness, from the analysis of the response 89.7% affirmed to be aware while 10.3% responded in the opposite.(...) From the analysis in table 3,, majority (33.6%) of the respondents attributed their information source to village leaders/neighbours/relatives, 28.3% identified radio, 17.7 % identified television while internet and newspaper were 13.7% and 6.7% respectively. The finding shows that 89.7 % of the respondents are aware of a cause of climate change while 10.3% are not aware. (....) Most (32.7%) attributed the cause of climate change effect to deforestation, followed by urbanization with 21.7 % while industrialization and logging has 20.7% and 23.7% respectively. (...) Table 5 shows that 89.3% of the respondents were of the opinion that the changing climatic condition has impact on the well-being of humans, 10% where not of the opinion while 0.7% was undecided.(...) As shown in table 6, 82.7% of respondents express regret on loss of species and other effects, 10% non – regret while 7.3% were undecided."

3	Less Rain and More Heat": Smallholders' Perception and Climate Change Adaptation Strategies in Tropical Environments	Ramírez, K. D. I.;Ibarra, A. M. A.	Sociedad y Ambiente	2019	10.31840/sya.v0i21.2040	"In the SES in the Maya zone, attention was paid to traditional knowledge related to climate variability. Firstly, the existence of local terminology for weather in the Maya language was explored.(...) The results yielded terminology covering different types of rain (Table 3). The term Nohoch yax k'iin was used in Mayan to refer to the great drought. Although there was no consensus in terms of the identification of a Mayan term to refer to intense rains in both localities, three types of rain that affected crops were identified (the respondents recognized them as 'bad rains'): Choco ja' (hot rain) Sabak ja' (acid rain) and Kankubul ja' (yellow rain). These types of rain were identified once the phenomena had passed, since they left marks on the crops. For example, when Choco ja' or hot rain falls, the following day, the crop foliage has black blemishes, as though it had been burnt. Choco ja' is produced by cyclones; it is referred to as saltwater that comes from the sea and burns the corn, making it unserviceable. With Sabak ja', white and grey blemishes appear on the foliage. This is the acid rain that falls during a heatwave. Kankubul ja' rain is produced when there are pink and yellow clouds, and when the rain falls, the ear of corn droops and produces small white balls.In both localities in the Maya zone, part of traditional knowledge about climate focuses on the "cabañuelas" which, in the Mayan language, are known as 'Xook K'iin' and are a traditional form of weather forecasting. A total of 58 % of the respondents in Señor and 40 % in Noh Cah agreed that older adults are the main source of knowledge about the "cabañuelas" and that this knowledge is being lost due to the lack of interest among youth to learn and work in the countryside, and also because they consider that the weather has changed so much that it is now difficult to continue using this forecasting system. Maya elders record observations of 'Xook K'iin' in three stages in January (Figure 3), by observing the behavior of the weather. During the first phase, observations are made during the first twelve days of January, which are assumed to correspond to the behavior of the weather for the twelve months of the year ahead. In other words, if the first day of January is sunny with very little wind, this means that the month of January of that year will also have these characteristics, and so on for the next 11 days. During the second phase, twelve days are recorded up to January 24, but the months are counted backwards, in other words, the forecast for the thirteenth day corresponds to the behavior of December, while the 14th day corresponds to November and so on. The third phase is registered from January 25 to 31. Here, the observations of the day were divided into two, in which the first half of the day corresponded to one month and the second half of the day to the next month. Finally, all the recorded observations indicated weather variations throughout the year from the outset. A total of 53 % of the respondents in Señor and 40 % in Noh Cah confirmed the validity of this form of weather forecasting. They consider it a useful tool for planning productive activities such as the milpa, apiculture and hunting, amongst others (pers. coms. A.E., 2015).(...) Forty per cent of the respondents from Señor acknowledged that 2014 had been a very dry year, otherwise known as a year of extended drought, while 70 % mentioned they had experienced intense rains in 2013. Moreover, the category three hurricane Roxanne occurred in 1995 and, according to the experiences recorded, this was the hurricane that caused the greatest damage in the Maya zone, affecting homes and productive areas. Changes in normal patterns of climate variability in Noh Cah have been observed. Ninety-six per cent of respondents confirmed that the current temperature in the zone is higher, while 39 % admit that this change has been perceived between the last one to five years. Changes in precipitation were detected by 100 % of the respondents. A total of 44 % reported having perceived these changes in past six to ten years, while 75 % stated that the bad rains (Choco ja', Sabak ja' and Kankubul ja') fall with greater frequency. Regarding the frequency of hurricanes, 80 % of respondents failed to report any changes. Participants in the focus groups agreed with these results. In accordance with the perception of the respondents, 70 % mentioned that the milpa is the productive activity that had been most affected by the changes in climate variability; the remainder mentioned the milpa but associated it with other activities, such as apiculture, horticulture, fruticulture and livestock raising. Nevertheless, 48 % of the respondents did not know what caused these changes in the weather, while 22 % attributed them to "Climate Change". The respondents in Noh Cah (52 %) consider that the climate will be worse in the future and that "only God knows what it will be like" (17 %). Moreover, the Señor community has perceived changes in the normal patterns of climate variability. Eighty-seven per cent of the respondents observed that the temperature had increased. However, the perception of this change amongst the participants varied over time, with 36 % conceding that these changes had been noted in the past decade. With respect to precipitation, 96 % of the respondents stated that it had changed, with 36 % reporting that this had been perceived in the past 10 years. A total of 45 % stated that the bad rains had increased in frequency, while 75 % noted changes in the frequency of hurricanes. Of the respondents, 87 % mentioned the milpa as one of the most severely affected activities, while 13 % mentioned the milpa in association with other activities such as apiculture, horticulture, habanero chili production and livestock raising. A total of 51 % of the respondents remarked that they did not know the cause of these changes, whilst 18 % attributed it to divine punishment. In this respect, Mr. P. X., a Maya leader, said during the interview that: "All this happens to us because we have not prayed; they have not prayed for the milpa, because the milpa has not been productive, they are punishments. Previously, a milpa with one hectare could sustain a family; now it can't, one hectare is not enough…". As for forecasts of the climate in the Señor locality, 56 % of the respondents thought the climate would be worse, while 26 % did not know what it would be like in the future. In Xcalak, 83 % of respondents confirmed they have perceived changes in the rain pattern, and that they currently experience less rain. Regarding the time frame for this perception, 65 % said that these changes have been observed in the past five years. Ninety-three per cent perceive that the climate has also changed, stating that they currently feel more heat. Again, 70 % remarked that this change has been detected in the past five years. In Xcalak, 62 % of the respondents considered that fishing is the activity most affected by changes in climate patterns, while;19 % considered that tourism is the most affected, and 19 % consider that both are affected. In the Xcalak community, 44 % of the population interviewed stated that they "do not know" what causes the changes they perceive, while 24 % commented that they are the result of "Climate Change". In Punta Allen, 96 % of the respondents have perceived changes in the rain pattern, noting that there is now less rain throughout the year. A total of 84 % reported that these changes had been perceived in the past 10 years, while 92 % of the respondents have also perceived temperature changes, mentioning that currently there is more heat than before. Of those, 89 % concede that this change has been perceived in the past five years. In Punta Allen, 46 % considered lobster fishing and tourism to be the most severely affected activities, while 42 % thought that the fin fishing and lobster fishing are the worst affected and 12 % commented that the most severely affected activity is tourism."
3	Perception of climate change and adaptation among small-holder cassava farmers in Anambra State, Nigeria	Madu, T.U.	Nigeria Agricultural Journal	2019		"Table 2 shows that all the temperature and precipitation response variables had mean scores greater than 3 except decreased temperature (1.86). Increased temperature, altered climatic range and increased rainfall had mean scores of 4.01, 4.25 and 3.56 respectively. This implies that they were in agreement with respect to the response questions. Others were; decreased rainfall (4.52), changing timing of rains (4.38) and frequency of droughts (4.02) with mean scores also greater than 3 indicating they were also in agreement with the response questions. These responses show evidence of varying climatic changes in the study area.(...) From the FGD discussion, the farmers are aware of climate change but the perception of climate change did not differ among gender in the zone. They perceived climate change as delay in on-set of rains, scarcity of drinking water due to drying up of streams, and excessive heat. The impacts include late planting, poor crop yields, spending more time to fetch water."
3	Assessment of food crop farmers indigenous strategies to climate change mitigation and adaptation in Imo State, Nigeria	Chidiebere-Mark, N. M.; Ejike, R. D.; Nwaiwu, J. C.; Nwankwo, O. O.; Ibe, G. O.	Journal of Agriculture and Food Sciences	2019		"The distribution of respondents about their awareness of climate change in the study area is presented on Table 1. The results revealed that majority (95.83%) of the respondents were aware of climate change while the remaining 4.17% of the respondents were unaware of climate change. With a greater percentage of the respondents aware of climate change, it is an indication that the rural farmers were informed about climate change trends in the study area.(...) The farmers perceived effects of climate change on crop production are presented in Table 2. From the results, all the items listed had mean scores above the cut-off point (discriminatory index) of 2.0 and hence implies that the farmers perceived these climate change factors had effects on crop production. The farmers perceived that droughts after planting reduces crop yield (Mean =2.44, SD= 0.802). The farmers perceived that late onset of rain reduces crop yield with a mean score of 2.43 (SD=0.784). Also, perceived that 'late onset of rain leads to late planting of crops' (Mean = 2.42; SD=0.800) and 'Climate change increases the incidence of pests and diseases infestations in crop farms' (Mean = 2.41; SD = 0.782) were perceived by the food crop farmers as climate change effects on crop production in the study area."

3	Climate change perception and adaptation among indigenous farmers : A study on Thamis of Dolkha	Thapa, B. J.	Banko Janakari	2019	10.3126/banko.v29i2.28098	"Climate change although an old phenomenon, was a new concept for the Thami Community. They understood climate change as the change in temperature and short-term weather. They could not relate disasters to climate change. Instead, they related climate change to weather change. The farmers' perceptions concerning climate change were mainly based on their indigenous knowledge. Besides, their perceptions were also found to have depended on awareness and non-formal trainings held in the villages. The Thamis use their own local terminologies for local climatic and weather phenomenon. (...) Seventy eight percent of the respondents experienced the decrease in the amount of rainfall in the month of March as compared to the past kindly check the sentence. The respondents also experienced severe droughts in the months of April and May. Rainfall was perceived to be unpredictable and erratic for the rest of the months. Sixteen percent of the respondents who replied that there was no water scarcity were the ones with year-round access to water for irrigation. The respondents perceived increase in temperature which according to them has led to increase in production of new kinds of fruits and vegetables in their villages. Most of the respondents replied that temperature had increased during the last decade, which coincided with the official scientific data.(...) Majority of the respondents also reported that they experienced warmer temperatures even in the colder months nowadays.(...) Due to such rise in temperature, numerous extreme weather events were reported to be experienced by the respondents in the area. The direct impacts due to increasing temperatures are reduced crop yield, erratic rainfall, increased pests and diseases, landslides and droughts in the study area.(...) The Thami farmers believed that incidences of droughts and floods in the village were due to "God's play" and nothing new. According to their elders, the rain clouds came in with the cold eastern winds and with the flowering of wheat or with the corn silk. As per the calendar, there should be regular incidences of rain arriving at mid-June instead of May. However, the farmers experienced heavy rainfall mostly accompanied by hail storms at the wrong time nowadays.(...) Some Thami farmers also perceived the decrease in rainfall by observing the local stream named "Kuthali Khola" which has not risen nowadays as compared to the past. They also reported that erratic rain had now affected the production of maize, one of the staple crops. Likewise, the melting of snow was rapid at higher altitudes in most winters nowadays, which was an unusual occurrence in the past. In the past, the arrival of winter was indicated by the snowfall on the nearby hill, which also indicated the end of monsoon rain. Now, the farmers rarely noticed snow on that hill. Likewise in the past, the sowing time for wheat was indicated by the flowering of Prunus cerasoides (Paiyun). Similalry, the flowering of Michalia champaca (Champ) indicated the sowing season for maize and the presence of Demoiselle crane (Karang Kurung) indicated the season for sowing cucumber and summer fruits. These incidences made the indigenous knowledge useless in some situations. Eighty five percent Thami respondents reported that agriculture sector was most affected by climate change. Similarly, 63% respondents indicated the impact of climate change on the availability of water for agriculture in the village."
3	Choice of Smallholder Farmers' Adaptation Strategies to Climatic Variability and Their Determinants in Crop Production: The Case of the Central Rift Valley of Ethiopia	Bekele, A.	Journal of Environment and Earth Science	2019	10.7176/JEES/9-4-04	"Analysis of farmers' perception of the impact and occurrence of climate change is typified by high temperature, short rain duration, prolonged dry spell and resurgence of new insect pests in the right order. The nature of climate change was defined in terms of rainfall amount and late onset, shortage at flowering, planting and plowing and early cessation of rainfall. The effects of climate change components were expressed as a threat to crop production (96%), drought (decreases in amount of rainfall) (76%), exhaustion (44%), death of livestock (32%) and illness of human beings (26%) (Figure 1). Assessment of farmers' perception of future occurrences of very important climate change elements, using their own definitions, shows that most (over 40%) of the farmers have the expectation that the threat/impact due to low/erratic/rainfall, pests (indirect threat) and high temperature would be low in the future and a significant proportion (over 20%) of the farmers said that the likelihood of future trends in climatic variables would be on the increase side (Fig. 2). Some farmers said that the existing scenario of high temperature (24.3%), pest infestation (14%) and low precipitation (8.7%) will prevail in similar manner in the future. A significant proportion of the farmers has been in a state of indecision about the future trends and impacts of climate change in terms of low/erratic rainfall (14.5%), occurrence of pests (12.3%) and high temperature (12.1%)."
2	Smallholder farmers' perception to climate change impact on crop production: Case from drought prone areas of Bangladesh	Roy, D.; Kowsari, M.S.; Nath, T.D.; Taiyebi, K.A.; Rashid, M.M.	International Journal of Agricultural Technolog	2018		"Data in Table 2 showed that majority of the respondents (57 percent) perceived that climate change had severe impact on crop production. Rest of the respondents (43 percent) perceived moderate impact on crop production and no farmer (0 percent) reported low impact of climate change on crop production. A perception index (PI) was employed to rank individual statement according to their perceived importance by the respondents (Table 3). The farmers identified increased pest infestation as the most important impact of climate change with a PI of 4.59. Increased intensity of droughts was found as second most important impact with a PI of 4.53 as perceived by the respondents. Climate change influenced crop production (PI = 4.30) was ranked as third important impact as perceived by the respondents. However, increased intensity of floods (PI = 2.94) was perceived as least important impact of climate change on crop production."
6	Risk perception and decision-making: do farmers consider risks from climate change?	Eitzinger, A.; Binder, C.R.; Meyer, M.A.	Climatic Change	2018	10.1007/s10584-018-2320-1	"Older farmers are more worried about climate change than younger farmers but rank production failure low as risk (see Fig. 4). (...) Regarding farmers' concerns (Fig. 3a), we found two issues experts and farmers agreed upon: poverty is a chief concern in this region (ranked first by experts and second by farmers) and neither climate change nor security problems are perceived to be relevant in the study area."
6	Climate change perception and impacts on cattle production in pastoral communities of northern Tanzania	Kimaro, E.G.; Mor, S.M.; Toribio, J.-A.L.M.L.	Pastoralism	2018	10.1186/s13570-018-0125-5	"A majority of cattle owners (98%; 128/130) reported experiencing a reduced amount of rainfall in their respective villages over the last 30 years. About three-quarters of cattle owners (75.4%; 98/130) reported experiencing erratic and more unpredictable rainfall. Most (98.5%; 128/130) also reported experiencing an increase in temperature over the same period. The majority of cattle owners (92.3%; 120/130) were able to recall and narrate the specific years in which they experienced severe water and pasture shortage in their respective villages (Table 3). (...) According to cattle owners, more villages have experienced years with severe water and pasture shortages in recent times. More than a half of the cattle owners (52.3%; 68/130) identified one or more possible reasons for the observed changes in climate. The majority (67.6%; 46/68) identified environmental destruction, including increased tree cutting in recent times, as the cause. Other explanations given included recent increases in the population of people and their livestock (n = 12) and natural changes/normal processes of the Earth (n = 10). A majority of cattle owners (73.8%; 96/130) reported that they had heard of the term 'climate change', of whom only 64 reported to understand what the term means. According to these participants, 'climate change' was thought to refer to changes in rainfall patterns (often erratic and with a decline in rainfall amount), rise in temperature and recurrent drought periods (n = 56). Fewer cattle owners perceived the term 'climate change' as referring to something related to environmental changes (n = 4), Earth's natural changes and processes (n = 2), or factories and industries (n = 2). The majority of cattle owners (88.5%; 115/130) reported worrying about the future impacts of climate change. When cattle owners were asked what worries them, almost all (95.6%; 110/115) reported that the uncertainties and unpredictability of rainfall, as well as increasing recurrent drought periods being a big concern for pasture and water availability for their livestock; they foresee that their cattle will suffer severely. Fewer cattle owners (4.3%; 5/115) indicated that they feared climate change impacts on general life. (...) In the focus groups, participants were asked 'what does the term climate change mean to you?' Many participants responded to this question by explaining the alarming changes in climate parameters, such as reductions in rainfall amount, unpredictable and shorter rainfall seasons, increasing temperature and prolonged drought periods. (...) In addition to the climatic changes described above, some participants also reported observing unusual climatic conditions, especially when the defense force (military) are undertaking military trainings close to their village area. However, this observation was pointed out by participants in two groups only, whose villages are located close to the military base. (...) Many participants reported experiencing shrinkage of grazing land and disappearance of vegetation cover in recent times that they link to reduced rainfall, and recurrent drought periods experienced. (...) Throughout the discussions, it was clear that participants are well aware of the changes in climate and alarming impacts of these changes for rangelands, soils and waterways happening in their respective villages. It was noticed that participants were very concerned by the trend of increasingly unpredictable rainfall and severe frequent drought periods which affect availability of pastures and water for livestock and degrade the soil and have already impacted on their livelihoods. Pastoralists indicated they are unsure what the future may hold. (...) Participants conveyed a number of factors that they thought could be the causes of climate change. Many participants reported that the growing human population contributes to environmental destruction. Participants reported that in previous times they used to see fewer 'bomas' (Maasai homestead). Conversely, there are many 'bomas' in recent times which is evidence of the increase in human population. However, during discussions it was noticed that participants did not really associate increasing numbers of livestock with climate change and/or environmental destruction. (...) Rather, participants were concerned about the increased population pressure within the same land area."

10	Indian time: time, seasonality, and culture in Traditional Ecological Knowledge of climate change	Chisholm Hatfield, S.; Marino, E.; Whyte, K.P.; Dello, K.D.; Mote, P.W.	Ecological Processes	2018	10.1186/s13717-018-0136-6	"These cues for human behavior include weather events, like the first appearance of snow on a certain mountain, botanical indicators like when berries emerge, and animal behaviors like the emergence of a certain species of ant."... in the spring, you got carpenter ants, big black carpenter ants, and [eel hunters] didn't go eeling until they saw those carpenter ants, they came out to mate, grow wings and fly off and start new colonies and stuff and that was what they marked when the weather was right to start eeling.... they marked other things the same way, but you can't do that anymore because our weather's changed so much that you can't mark anything like that; there's no way to do it." (Oscar Hatfield, CTSI Elder) (...). This example is also directly (if implicitly) related to climate change caused by rising greenhouse gases, as noted by the comments on changing weather. Winter seasons are shorter and spring seasons are notably occurring earlier in the Pacific Northwest. (...) Regardless of cause, all interviewees were hesitant and anxious about the manner, rate, and sustainability of resource use. This anxiety, which extends to resources not yet in decline, stems from uncertainties that cannot be explained with the traditional stories, songs, or cycles that have been witnessed and conveyed for generations. TEK, then, has been rendered inconsistently reliable by climate-driven uncertainty. (...) The scope of observable change demonstrated by interviewees is profound, even to the point of altering foundational ceremonies. For example, in the traditional marriage ceremony of the Siletz, a woman accepted a man's marriage proposal, in response he gave a dowry to her family, she then would move into their new home and make ceremonial acorn soup; the soup completed the marriage ceremony, and the couple was then considered married. For complex reasons including the Tribe's relocation in the 1850s but also the dwindling population of oak trees in western Oregon, the acorn soup part of this ritual is no longer practiced. Invasive species like Scotch broom and Himalayan blackberry prevent survival of oak seedlings, which require moist soil and ground cover of leaf litter for propagation and survival. Additionally, the Quinault Indian Nation described the traditional practice that Elders had for collecting eels (Pacific Lamprey) during the spring. Because the eel population has declined, this collection practice has largely died out, and even the Elders who prepare and consume eels rely primarily on the fish hatchery, which collects a few every spring, mainly for the Elders who request them. Justine James (QIN) states: "A lot of the eels in this area, they started going out in about the 60s, some of the Elders still follow that old life-way of eating, preparing eels, and it's kind of a dietary change and the logging practices have kind of altered the environment and so you don't get the eels as much." (...). Nearly every participant described changes they had observed and expressed anxiety about these changes, but also expressed apprehension about future changes. These perspectives included changes resulting from a host of factors connected to the cataclysmic replacement of an Indigenous management system of the socio-political and natural environment in North America, with a Western management system. The latter system has brought assimilation pressures, economic upheaval, increases in invasive species, ecosystem changes, and climate change together. In other words, by not compartmentalizing climate change from other human-environmental changes, connections among human action and resulting risk to animal and plant species are more visible in a TEK epistemological construction of climate change."
2	Farmers' perception of climate change and adaptation strategies in the Dabus watershed, North-West Ethiopia	Asrat, P.; Simane, B.	Ecological Processes	2018	10.1186/s13717-018-0118-8	"The descriptive analysis indicated that about 52% of the respondents from the wet lowland and 62% from the dry lowland had perceived a change in climate (Table 1). This difference in perception of climate change between the two locations is statistically significant ($\chi 2 = 6.636$ with $P < 0.001$). The descriptive analysis also signified that more than 55% of the respondents perceived an increasing trend in temperature while 42 and 25%, respectively, perceived a stable and decreasing temperature. Regarding precipitation, about 64% of the respondents indicated a decreasing trend while 34% of them testified an increasing trend. Parallel to this, those farmers who inferred an increasing trend in temperature and a decreasing trend in precipitation specified the respective local indicators that make them deduce these trends (Table 2)."
10	Perceptions of climate change impacts and adaptation measures used by crop smallholder farmers in Amathole district municipality, Eastern Cape province, South Africa	Popoola, O.O.; Monde, N.; Yusuf, S.F.G.	GeoJournal	2018	10.1007/s10708-017-9829-0	"Farmers were asked about their perceptions of temperature and rainfall changes in the area over the last 25 years (Table 1). The majority (86.92%) indicated that they perceived an increase in temperature levels, while 90.77% perceived a decrease in the amount of rainfall over the period. (...) The majority (99%, x = 2:77) perceived drought conditions as one of the most pronounced climate changes in the area; this result correlates with the perception of increased temperatures and an acute decrease in rainfall (Table 1). Other perceived climate changes, indicated by more than 50% of respondents as threats in the study area, include heat waves (85%, x = 1:98), wind speeds (67%, x = 1:54) and fires (56%, x = 1:20). Farmers expressed that past experiences of drought, heat waves and fires raised their anxiety and uncertainty about livelihoods, due to loss of fields to fire, shortages of water (for agricultural and domestic use) and winds that are capable of destroying houses and crops.
6	Climate change perceptions and adaptations of smallholder farmers in Eastern Kenya	Kichamu, E.A.; Ziro, J.S.; Palaniappan, G.; Ross, H.	Environment, Development and Sustainability	2018	10.1007/s10668-017-0010-1	"Climatic events that the participants perceived to have disrupted agriculture in the past 30 years (Roundtable step 1, brainstorming a timeline of climate events) are shown in Table 2. The participants unanimously agreed that the 1984 drought, which affected the whole country including Matungulu Sub-County, was the most severe event. There was scant rain for three consecutive seasons leading to a great famine in the area as no crops were produced at all. Locals had a unique name for this drought ''Ngwa ngwete'', to mean ''I will die with money in my pocket''. It was so severe that even those who could afford to buy food could not do so as there was no food in the market. The participants noted that in the drought years, crop pest infestation increased considerably, destroying any surviving crops. Over the three roundtables, the farmers tended to agree on potential risks and opportunities. They identified potential benefits posed by climate variability such as increased farm profits in the case of increased precipitation, when both crop and livestock productivity improve. The risks identified were the increasingly unpredictable weather patterns and increased drought frequency which reduces yields owing to water scarcity, and leads to increase in crop pests and makes livestock more susceptible to diseases. The farmers also reiterated that increased pest infestations, which always occur after a drought episode, increased the cost of production, increasing the strain on farm incomes. The late short rains were also identified as a major risk as they inhibit timely planting. The participants also said that they have realised that the onset of both short and long rains have changed and become less predictable. (...) Almost all the participants in the three roundtables were concerned about climate variability, particularly increased drought frequency and heavy rains as these directly affected their livelihoods. The participants said that the frequent droughts, increase in pest infestations and heavy rains relate to the changing climate. They had fears that this could go on into the future, affecting their livelihoods. The participants felt that if climate extremes continue, they will not be able to harvest anything, for they rely solely on rain fed agriculture unless they employ climate adaptation strategies. (...) The respondent's perceptions of climate change were largely linked to the intensity of adverse weather events that affected farming. The responses across the three diagrams show that the climate related variables: drought, pests and diseases, and heavy rains cause low crop and livestock yields which eventually lead to low farm incomes. The low farm incomes have influences such as school drop outs, increased crime rate and poverty. The participants considered that drought is the major climate variable that affects both crop and livestock productivity in the area, citing the major risk as water scarcity. The participants further asserted that low yields lead to high commodity prices as the produce is scarce in the market. Moreover, participants noted that heavy rains lead to severe flooding which results in low crop yields due to waterlogging, post-harvest losses, destruction of roads and livestock deaths. The participants further observed that the increase in pest and disease infestation is mostly due to increased temperatures and excessive precipitation. Table 3 shows the effects of this on agricultural production, including reduced crop and livestock yields that result in loss of farm income. They also noted that crops are more affected by pests and diseases than livestock. They further stated that the losses due to pest infestations are largely due to misidentification of pests and subsequent wrong choice of pesticides."
26	We're the same as the Inuit!: Exploring Australian Aboriginal perceptions of climate change in a multidisciplinary mixed methods study	Nash, D.; Memmott, P.; Reser, J.; Suliman, S.	Energy Research and Social Science	2018	10.1016/j.erss.2018.06.027	"In addition many if not most of our Georgina area respondents are multicultural Indigenous Australians, who, despite their remote location, are regularly exposed to the domestic and international 'information environment'. 'Climate change' was not a new or unfamiliar topic and in many ways is a quintessentially Indigenous Australian issue and consideration. (...) Acceptance of the reality of climate change by respondents of both the UGRB survey and the national surveys was almost identical (c.75%), however self-reported i.e. subjective knowledge, that might inform this view was markedly different with UGRB respondents feeling less confident about specific aspects of climate change as used by researchers. Furthermore 44% of Georgina Basin respondents thought that the effects of changes would be felt far away from them whereas only 8% of the national survey respondents thought that way. Significantly, 54% of Georgina Basin people reported personal experience with natural disaster compared to only 37% of national survey respondents in 2010, and 60% of Georgina Basin respondents reported being worried about the specific aspects of climate change compared to 64% of national survey respondents in 2011 who reported being 'very' or 'fairly' concerned. (...) However, the findings suggest that indigenous worldviews were influencing the respondents' attitudes and knowledge of environmental changes, including identifying these changes as a cause for 'worry' (the term substituted for 'concern' used in national surveys). While the majority of the GB respondents reported 'little knowledge' of climate change, other responses demonstrated their considerable knowledge of local climatic features and dynamics in the environment. Although significant for Georgina people, the perception of risks associated with climate change appears to be in the background compared to more general, immediate and familiar weather and climate impacts. Consequently, specific concerns about climate change appear to be less relevant in the lives of Georgina people compared to the broader Australian community. At the same time however the UGRB respondents do recognise and are responding to changes, as they are understood by climate scientists, and the research pursued the potential for appropriate adaptive responses. (...) We recognise that individuals in the Georgina region had diverse knowledge and experience of climate change for understanding climate change and related phenomena. Nevertheless some participants had experienced extreme weather events and had connected this to global events as well as the experiences of other groups in ways that were transformative: Cylcone Yasi ripped the leaves off trees … now if you get a cyclone that far inland, surely it's to do with climate change. We're the same as the Inuit! (Waluwarra woman, Mt Isa)."

2	Human perception of climate change	Rankoana, S.A.	Weather	2018	10.1002/wea.3204	"Participants were first asked if they had noticed any changes in climate conditions over the past 22 years. Responses from all participants revealed a general perception of changes in temperature and rainfall over the past 24 years, with negative consequences on the community's indigenous livelihood resources. Responses from focus group discussions show that there is certainty among participants that weather conditions over their area are changing. The majority (89%) of participants had noticed changing patterns in temperature variations since 1993, and 91% identified temperature variations as a major indication of changing weather patterns. The participants of the in-depth interviews (25% of the study participants, referred to as 'key informants') mentioned that long-term change in temperatures are responsible for excessively hot and dry summers. (...) From the focus group discussions, it was found that 96% of participants believed that decreases in rainfall were indicative of changing weather conditions. Specifically, the participants reported having observed a change in the timing of rainfall, which in recent years has occurred between late November and January rather than September and December. Rainfall unpredictability is related to increased water shortages and a reduction in biodiversity. Participants' reports of a decrease in rainfall were related to their perceptions of lack of cloud formation, changing seasons, and changes in the movement and position of the sun. Participants reported believing that an increase in temperature has rendered cloud formation impossible (and that clouds are formed by the interchange of cold and hot weather patterns). Study participants reported believing that summers are becoming longer, while winters are becoming shorter; they also stated that winter is no longer cold, but is warmer, with unusual precipitation. The participants also believe that there has been a change in the positioning of celestial bodies. They stated that the normal position of the sun in summer is towards the south, and in winter it is towards the north, and thirty-two elders reported that the sun remains towards the south until mid-winter, when it is supposed to be in the north. This, according to the elders, marks a change in weather patterns. (...) Most of the participants in this study (87%) reported that, under conditions of increased temperature and reduced rainfall, subsistence food production is declining. (...) Observations from 56% of participants revealed that a drop in subsistence consumption is a result of changes in temperature and rainfall patterns, which have led to poor productivity and harvest, and a shortage of indigenous food sources."
11	Climate change adaptation: Linking indigenous knowledge with western science for effective adaptation	Makondo, C.C.; Thomas, D.S.G.	Environmental Science and Policy	2018	10.1016/j.envsci.2018.06.014	not applicable
11	Climate, the Earth, and God – Entangled narratives of cultural and climatic change in the Peruvian Andes	Scoville-Simonds, M.	World Development	2018	10.1016/j.worlddev.2018.06.012	"In the following two sub-sections two local 'climate narratives' will be identified, both of which make direct reference to differing religious beliefs, the pago ritual, and the use of alcohol in particular. (...) Harsh climatic conditions have always been a part of agro-pastoral activities in the Andes. In the interviews, community members identified a number of climaterelated factors and the direct and indirect effects that these have on their livelihoods (Table 1). Among these, hail and frost were the most frequently mentioned and identified as the most problematic, with impacts on both sustenance (potatoes) and cashoriented (livestock) activities. Informants rarely referred to the 'climate' in abstract terms, but rather either identified specific problems and factors such as those presented in Table 1, or referred to their relationship with 'the earth' more holistically, with these specific issues being understood as part of that relationship. It is tempting to interpret these results as evidence of 'local perception (i.e. detection) of climate change.' Indeed, a number of interviewees did mention increasingly problematic climate conditions (in particular, related to heat and cold extremes, solar irradiation, decreased water availability, and concentration of rainfall in shorter, more significant bursts) on the time scale of generations. However, a number of other interviewees on the contrary reported improved or unchanged climatic conditions, even in relation to the same variables and within very small geographical distances. Generally, there was not sufficiently consistent agreement on which to base any conclusions about how local climatic variables are actually changing. Given that this was a qualitative study based on semi-structured interviews with a small number of respondents, it cannot be concluded from this study alone that local community members 'are experiencing climate change impacts.' In any case, this was not the purpose of the study. (...) One local narrative on climate-related problems and changes espoused by self-identified Catholics explains negative climatic problems and changes as the result of failing to perform pagos. In this narrative, the traditional function of pagos as an important way of maintaining positive reciprocal relationships with the environment is emphasized. Maintaining 'good relations' with the earth in this way is seen as crucial for avoiding problems like cattle sickness and crop losses, as well as for being able to notice key weather-related signs in the environment. According to this narrative, it is because people (especially Evangelicals) have abandoned pago a la tierra that the community is experiencing problematic and unpredictable climatic conditions. One extract from an interview demonstrates this particularly well: Before, when I was a boy, there were qollana15 who descended from the sky to the earth, in a place beyond Checca, and we would bring them a sheep on December 25th. On that date, people paid an offering for the first of January. The harvest used to be abundant, then when people stopped offering, everything went away – frost, frost. —When they stopped offering the frost came? Yes, to this day. —How many years ago was this? People used to offer every year. In Checca there were curacas and in the 60's more or less people were still offering. In the 70's and 80's no. In the 2000's – ¡ni pensar ya! [forget about it!]. (Interview #14). This interviewee later goes on to describe how he continues to perform pagos but only on an individual scale, and links the fact that he 'paid well' with the good production he enjoyed this year. Informants also mentioned the risks of not performing pagos: 'For the earth it is good [. . .] We are walking on the earth after all – yes it is useful – we are talking, we are walking on the earth [. . .] When you don't give to the earth, your cow gets sick' (Interview #7). According to informants, what is received by humans in this reciprocal relationship with the environment and maintained through pagos is not only good production or avoiding problems, but also signs for predicting the weather. One respondent (Interview #14) who was asked whether there were people who could predict a good or bad harvest replied that, 'before there were many, they measured the weather. Not anymore. Religion has destroyed everything. Now there are many religions [Evangelicals] and there are no more Catholics, only a few.' When asked specifically whether he thought the climate was going to improve or get worse, he replied, 'I think. . . I can't decide because el Alto [God] knows how it will be, Jesus Christ knows all. We can all just comment on it.' Nevertheless, this interviewee then went on to predict that there would be sufficient rainfall for planting and good harvest this year because of two signs he had seen: the presence and good appearance ('verdecito, bacán') of a kind of algae (laqu) in the river, and the fact that he had seen, just that morning, that a stone had 'walked' in the sand about 20 cm. He explained that, 'for some of us this means something, for others, no. Before, everyone could see that, now with religion, nada que ver [there is no comparison]'. Similar kinds of weather prediction signs in the Andes have been described by others, as discussed in the introduction. What is more relevant here is the local perception that the faltering usefulness of these signs or lack of ability to interpret them is attributed to evangelization. Some respondents continue to keep up the practice on an individual scale, and maintain that pagos are an effective way of ensuring good production and avoiding problems like hail, frost and sick cattle. Yet, often, respondents seemed reluctant to discuss the details of pagos or admit that they still perform them. In one case, the interviewee seems at times unwilling even to mention pago and instead refers to it repeatedly as esas cosas, 'those things': —There aren't any problems in potato production? No problems, except that the potato doesn't grow, but what are we going to do? Our Lord doesn't wish it. We have no food, few potatoes. —Why are there so few potatoes? I don't know, with the hail and the frost... In the rainy months – January, February and March – there is a lot of hail, so when the potato plants are blooming they all get 'burnt', as if you threw a rock at them. So the potatoes don't grow, only a few. —And before, this used to happen with the hail? No, this didn't used to happen because there was good harvest, because they [our ancestors] used to love our earth. They used to do 'all those things'. But now science has changed many things. So now we don't do 'those things', they say... I don't know how it would be... I can't really tell you 'all those little things'. —What isn't done anymore? Well, they used to do an haywarisqa, a pago to the Santa Tierra. At everyone's house, in the carnaval months, in February, they would do that. We would burn our corn, our coca leaves, our... We did all that – when I was young, not anymore. In those days, we would scamper around on horses, pucha, at everyone's house. Now that has disappeared, it doesn't exist anymore. In those days, our great grandparents loved and believed a lot. But now the religions have arrived. Now 'those things' no longer exist, year by year they are disappearing. (Interview #38). (...) A second local narrative, rooted in local Evangelical beliefs, interprets changing climatic conditions as signs of the end of the world drawing near. (...) The interviews conducted during fieldwork in this study area suggest another interpretation. Many interviewees did express a concern that weather patterns were shifting from what they had experienced as 'normal' to patterns that they found excessive, unpredictable and erratic, suggesting a perceived loss of order. However, despite possible pre-Christian roots in Andean eschatological beliefs, most interviewees who talked about the end of the world used the term 'el fin del mundo', and referred specifically to their Evangelical faith and to end-time descriptions in the Bible. (...) For example, when asked to explain changes in the rainy season she had described, one woman replied, 'Our Lord determines the weather. The Lord himself, the Bible says that when the end of the world approaches, there is no water, there is no rain, there is no chakra [agriculture/food]' (Interview #16). Another interviewee who was asked to explain the cause of new diseases and a worm affecting potato production explained, I don't know, I can't say where it comes from, what causes it. But it must be – as I am an Evangelical – in the Bible it says that these kinds of diseases must appear in the final times, in the final days. That's what I think. (Interview #2). Other interviewees similarly said that everything is occurring as it is written in the Bible (Interview #9), or explained worsening cold, snows, rain, and cattle disease as signs of the ending of time (Interview #55). (...) One peculiar feature of this narrative is that it links climaterelated problems and changes to an apparent shortening or quickening of the passage of time. As one interviewee put it, 'before time did not go by, the days were long. Now, no, quickly the days, weeks, years go by' (Interview #9). Another self-identified Evangelical informant indicated that the weather changes she described (colder, sun burning like fire) could not go back to the way they were before and immediately added that, 'the month is like a week, the week like a day. . . time is passing very quickly. Before the years couldn't go by; not any longer' (Interview #13). That is, for at least this interviewee, there is a logical connection between changing climatic conditions, quicker time, and the irreversibility of those changes. Other informants likewise explained changes in climate such as worsening cold spells or excessive heat impeding pasture growth in terms of time shortening, repeating the use of a fixed phrase, 'el tiempo se está acortando [time is getting shorter]' (Interviews #55 and #32)."

26	Perceptions of climate change variability and adaptation strategies on smallholder dairy farming systems: Insights from Siaya Sub-County of Western Kenya	Wetende, E.; Olago, D.; Ogara, W.	Environmental Development	2018	10.1016/j.envdev.2018.08.001	"Results from FGDs and Key Informants (KIs) interviews revealed that drought incidences (expressed as prolonged dry spells) had increased, with drying of rivers that were once perennial singled out as one of the major indicators. (...) Focus group discussions revealed that the intensity and pattern of rains during the main rainfall seasons had changed and that it exhibited a high degree of irregularity, leading to frequent food and fodder crop failure. More discussions with KIs affirmed that rainfall patterns had changed to the extent that short rains were now more reliable as reflected through lower crop failure rates on farms compared to the long rains seasons.(...) There was a strong consensus amongst FGD participants that temperatures of the study area had increased, and was based on observation of emergence of invasive noxious weeds that traditionally occupied areas that were hotter and drier than the study location."
10	In the light of change: a mixed methods investigation of climate perceptions and the instrumental record in northern Sweden	Furberg, M.; Hondula, D.M.; Saha, M.V.; Nilsson, M.	Population and Environment	2018	10.1007/s11111-018-0302-x	"In general, the qualitative study concluded that climate change was just one more stressor that, added to multiple other stressors, were pushing the Sami reindeer herders toward the limit of their abilities to adapt to an evolving physical, social, cultural, ecological, and economic environment. Some respondents even indicated uncertainty about the viability of the reindeer herding lifestyle beyond the present generation. (...) With respect to environmental changes, respondents identified changes in several different ways and they reported extensive alterations to the weather and climate since the 1970s, which they also perceived to have accelerated during the first decade of the 2000s. The changes included long and warm autumns, later onset of freezing conditions, shorter snow cover season, early and sudden onset of spring and more unstable, unpredictable and variable weather. Autumns were reported as longer, warmer, and wetter where persistent snow cover is established later in the season and water freezes over much later as well. This affects the reindeer herders' ability to move the herd on foot during the annual migrations. Temperatures that persist around 0 °C during a rainy autumn can Block^ the grazing under a layer of ice instead of snow preventing the reindeer from accessing the food, thereby ruining the pasture for a whole winter under worst circumstances. "When we moved down in the past, the waters froze in the autumn, there was a bit of snow, it was cold, it started in October already. Waters froze over in October and we used to move the herd one month before Christmas using all the lakes … and back then there were ice on them at that time… But now they stay open … until … well they are still open". – herder 3. Winters were experienced as much warmer and the long, cold, stable periods once familiar to the herders are more unusual or completely gone. These periods used to make it possible for herders to do other things knowing they did not have to be prepared to move the herd every day since the conditions were stable for a long period. The general impression among the herders was that the snow cover season had grown much shorter. The stories included some contradictory opinions regarding the end of the snow season though, especially in the high mountains where the snow cover was perceived to persist a lot longer than previously. Both of these contradictory observations were reported from the same area of Sarek national park (corresponding to station Kvikkjokk). "The cold period became very short, when the temperatures went below 25 degrees, it was only for a few days … that is new … Last cold winter was in 1986. … From 1986 and onward, it got a lot warmer.We rarely had temperatures below 20 degrees…before then, winter temperatures reached minus 30- 35- 40 degrees Celsius". – herder 10. "There was snow in November and it used to be thaw around Epiphany and then cold lasted until spring but today weather is more helter-skelter". – herder 10. Spring was said to now come early and very abruptly, weeks earlier in many places than in the past. The perspective also existed that spring might then come to a halt for many weeks, making the winter pastures perishable and unfitting when the summer pastures are still inappropriate due to rough conditions and heavy snow. The period between winter and summer grazing has always been a difficult time and today that difficulty is exaggerated by the extensive forestry that has reduced old intact forests with arboreal beard lichen (Usnea of the family Parmeliaceae) to a minimum, beard lichen constituting the classic reindeer emergency forage. "And already in March spring starts and in April with bare spots and all. It was not like that when I grew up, back then there were no bare spots until way into May". – herder 8. Summers were perceived to have changed the least but the herders experienced increased and shifting vegetation from lichen to grass and shrubs and a rapidly climbing tree-line. In terms of weather conditions, the interviewees experienced and emphasized an increased variability in the weather, making it more unpredictable and unstable. Changes in the weather result in the need to move the herd and more frequent changes hence markedly increase the workload on the herders. Rapid and extreme fluctuations in temperatures and extreme weather were perceived to have become more common and several herders emphasized the increased variability and instability but they also talked about increased weather intensity. "It's like this (demonstrates huge waves with the hand) up and down all the time. In recent years, we've also started to say that when we've had a cold snap of say 15 degrees (°C), that's been a lot. And we know that it's now 2 days later and it's above zero. This is what it's been like in recent years. … One evening it was suddenly plus two degrees (°C). It went like from 20 to 2 degrees (°C) in just a few hours, but then it went back down again. This kind of uneven temperature is something that you think has started to occur more recently—these sudden shifts in temperature I mean". – herder 5. The herders had heard and learned about climate change effects from the media as well as being informed by the authorities about projected changes. Some reindeer herders even perceived projections of future climate change as an even heavier burden than the already tangible effects they had themselves noticed. As pastoralists, the reindeer herders are experts on adaptation and handling change but now articulated that they were coming under severe stress. The herders did not recognize themselves anymore and believed that the old rules of traditional knowledge no longer hold true, as the lived experiences of the older generations become less relevant for today's herders facing what they perceive as a different weather regime."
6	Local perceptions of environmental changes in fishing communities of southwest Madagascar	Lemahieu, A.; Scott, L.; Malherbe, W.S.; Mahatante, P.T.; Randrianarimanan	Ocean and Coastal Management	2018	10.1016/j.ocecoaman.2018.06.012	not applicable
6	Evolving high altitude livelihoods and climate change: a study from Rasuwa District, Nepal	Merrey, D.J.; Hussain, A.; Tamang, D.D.; Thapa, B.; Prakash, A.	Food Security	2018	10.1007/s12571-018-0827-y	"At all study sites, local people had perceived changes in climate over the past 10 years (Table 5). In Gatlang, people reported they had observed changes in precipitation patterns over time. Ten years earlier, the village used to receive higher snowfall, both in frequency and amount. People also reported an increase in the incidence of erratic rainfall events, particularly in 2004–2014. However, rainfall patterns were considered 'normal' in 2015 and 2016. People also had observed that winters are now colder and summers warmer than 10 years ago. In Goljung, people noticed more variability in rainfall patterns and increased incidence of erratic events. They also perceived an increase in the number of foggy days in winter over the last 10 years, and an increase in the number of hailstorms. Similar to Gatlang and Goljung, people in Chilime also reported changes in rainfall patterns and temperature over time. Summers are hotter and winters colder. In the last 18 years, they observed only two snowfall events, both in the same year. In Thuman, people perceived changes in rainfall patterns, and reported hotter summers and colder winters than 10 years before. In Grey, local people reported an increase in the incidence of erratic rainfall."
6	Rainfall variability and drought characteristics in two agro-climatic zones: An assessment of climate change challenges in Africa	Ayanlade, A.; Radeny, M.; Morton, J.F.; Muchaba, T.	Science of the Total Environment	2018	10.1016/j.scitotenv.2018.02.196	"Therefore, we asked the farmers questions relating to the definitions of the drought. The majority of farmers (nearly 69%) defined drought as a period of "prolonged dry spell during rainy seasons" and others as "no rainfall in some days of rainy season" (Table 6). They said that dry spells or drought (ogbele in Yoruba, the local language) is "a time with very little or no rainfall". With changes in climate however, it has been observed that "sometimes little rain falls for a short time and prolonged drought is more frequent". (...) From these definitions, it appears that farmers in these agro-climatic zones have a clear understanding of drought and the climatic circumstances they find themselves in. The most common responses from the questionnaire and the FGDs are that the farmers have experienced: late rainfall onset in the past 30 years; changes in duration and cessation of rainfall; and frequent and lengthy dry spells within the growing seasons. Many of them observed frequent occurrence of droughts during the rainy seasons and believed that it has been a result of climate change. The farmers complained bitterly that drought has threatened agriculture and subsequently food security, the income of farmers and their livelihood. Many of the farmers believe that extreme climatic events are caused by "a supreme being" who has "decided to recompense for the sins they have committed". Most of the farmers thought that recurrent and prolonged droughts are one of the signs of climate change. They explained further how climate change has strongly affected their farm production. Many complaints were recorded from the maize farmers who complained that the "rain started this year (2016) in early March only to stop in early April destroying their maize seedlings". The majority of the farmers perceived that rainfall onset, duration, and cessation have not been normal over the past ten years."

6	Understanding climate change perception in community-based management contexts: Perspectives of two indigenous communities	Ambrosio-Albala, P.; Delgado-Serrano, M.M.	Weather, Climate, and Society	2018	10.1175/WCAS-D-17-0049.1	"Eleven participants are significantly associated with this factor. This perception is characterized by an ecocentric vision of nature (S15) and a strong concern about the environment (S40). For these participants, natural resources are limited (S34) and fragile (S36). According to these participants, a change in the environment can negatively impact the community (S23). People holding this view acknowledge the importance of CC (S39) and firmly believe there is enough information to assert that CC is real (S14). People with this perception claim that CC can have very negative impacts (S29) on the community (S11) and worldwide (S10). As a community, they are concerned with environmental problems and believe that people should feel concerned about CC (S20). These participants demand the involvement of industrialized countries in dealing with CC (S37), but the roles and participation of private industries are not very clear to them (S41). (...) 2) COMMUNITY COUNCIL 2: IS THERE A NEED FOR ACTION? Four women and one man represent this viewpoint. People holding this view are concerned about the environment (S40), strongly agree that people do not think long term about their actions (S6), and believe that plants, animals, and humans have the same rights to exist (S15). These participants do not feel responsible for contributing to CC (S1) and reject the idea that weather patterns have changed in their territory (S17). Additionally, they mistrust scientific information about CC (S14, S32). They believe that CC may bring positive consequences to their territory (S11), but at the same time, they feel the need to stop CC to save ecosystems (S2). Therefore, from their perspective, there is no need for the local government to protect their territory from the effects of CC (S4), and it is not necessary to act before something occurs (S24). This result appears to contradict their views that a lack of action might create problems (S29), and people should be concerned about CC issues (S20). Overall, these participants believe CC should be a priority for the government (S18). Moreover, they consider that a change should occur regard less of what the government does (S27), and CC should be addressed now (S12). 3) COMMUNITY COUNCIL 3: TIME TO ACT Three women are associated with this perception. These participants believe that humans have different rights from plants and animals (S15). They recognize collective responsibility for environmental problems (S35, S1) and a collective obligation to address CC (S27, S37). Central to this perception is that humans should feel more concerned about CC, regardless of if they can control it (S20), and that actions should occur sooner rather than later (S27). These participants demonstrate a preventive attitude (S24) to avoid disastrous conse quences to ecosystems, culture, traditions (S2, S23, S29), and the community (S11). Because they believe that nature can recover from any damage caused by people (S36), it is not necessary to prioritize CC on the political agenda (S18), although it is wise to have a cautious attitude (S24). Despite not seeing changes in their territory (S17), they think that local people and the government should be better involved with CC issues (S13, S4). For them, the role of science and scientists is called into question (S19, S32). Even though they think there is enough information to state that CC is real (S14), they believe they still need more information (S9). The consensus areas show that environmental problems are everyone's responsibility and that CC affects communities globally and should not be left to future generations. According to community councils, the government must prioritize CC in their agenda and assume these duties through legislation. People recognize the need to receive more information about CC from environmental organizations or the media since the government is not a trustworthy source of information. We found some inconsistencies within the Colombian community: for example, in relation to information sources, as the roles of scientists were mistrusted by one of the perception types. Also, there is no clear position on whether it is better to have a preventive attitude in regard to CC or if a change in behavior from people in industrialized countries could slow the effects of CC. [...] 1) COMALTEPEC 1: CC IS A GLOBAL ISSUE The first factor represents the views of 15 people. Participants whose perceptions load significantly on this factor acknowledge that nature is fragile (S36), so humans should learn how to use it wisely (S34). This perception is consistent with the egalitarianism worldview. However, these participants recognize that natural resources in their territory are sometimes misused (S33) and that people think in the short term about their actions (S6). Respondents acknowledge CC as a major environmental issue (S39). Although these respondents believe that CC will not affect local culture and traditions (S23), they believe that CC could have disastrous consequences for their territory (S29) that should not be left to future generations (S12). Therefore, there should be more proactive participation and involvement of the government in CC and environmental issues (S18). This matter should be a priority on the political agenda (S21) and should be approached globally (S37), for example, by governments and people in richer countries but not exclusively by the government (S27). They do not perceive disagreement among scientists about CC (S19) and positively value the role of the media in communicating about CC (S3). One of the community members of Comaltepec holding this perception stated, ''It is necessary to enhance the culture of not littering anywhere and to save water'' (Participant 10). 2) COMALTEPEC 2: THE LOCAL PERSPECTIVE Four people held this perception in the Mexican community, acknowledging a shared responsibility for environmental issues. This perception type is charac terized by an ecocentric vision of nature, namely, plants and animals having the same rights as humans (S15). These respondents agree that environmental problems are a matter of global concern (S35), with CC being a global matter (S10), and admit that people think short sightedly about the consequences of their attitudes toward the environment (S6). These respondents feel neutral about CC being a priority for the government (S18). However, they demand more responsibility from the government (S21), people from industrialized countries (S37), and local organizations (S13) for tackling CC and environmental problems. This contrasts with the idea that they are neutral about leaving CC to be addressed by future generations (S12); they reject the impact of CC on traditions and culture (S23). People with this viewpoint are satisfied with the level of information they have about CC (S9) and how the media and environmental organizations convey and communicate messages about CC (S3, S31). One of the community members stated, ''This exercise helps me realize how separated we are from climate change'' (Participant 7). 3) COMALTEPEC 3: NO NEED FOR CONCERN ABOUT CC One man and one woman are significantly associated with this factor. Although people holding this perception type believe that natural resources might be misused in the community (S33), they consider that people think long term about the consequences of their actions on the environment (S6). These respondents do not perceive changes in the weather patterns in their territory (S17), but they stress that there is enough information to declare that CC is real (S14). According to their views, any change in the environment could result in changes in culture (S23), but CC could have positive consequences for their community (S11). These respondents believe that there is no need to preserve the environment and the ecosystems or to address CC (S2) and that it is not a problem to leave CC to future generations (S12). This perception type reflects the notion that people in industrialized countries will not be affected by CC (S10) and also that a change in their behavior does not necessarily mean a decrease in the effect of CC (S37). Nevertheless, it is highlighted that CC should be on the political agenda (S18). According to them, the media does a poor and unreliable job of conveying and communicating CC information (S3, S7). Instead, they look favorably on what comes from the government (S8) and the role legislation plays in CC issues (S21)."
6	Comparing smallholder farmers' perception of climate change with meteorological data: Experience from seven agroecological zones of Tanzania	Mkonda, M.Y.; He, X.; Festin, E.S.	Weather, Climate, and Society	2018	10.1175/WCAS-D-17-0036.1	"The results from analyses show that farmers perceived a notable change in climate in the recent years.(...) It was further revealed that there was a correlation between farmers' experience and the knowledge of climate. Table 4 indicates that old people (.74 years) were sure (at 90.3%) that climate variables have been changing compared to 89.2% of those aged between 54 and 73 years, 88.4% of those between 34 and 53 years, and 85.5% of those between 18 and 33 years. Further, the result in Table 4 indicates that over 85% of farmers have noticed that the climate is changing. (...) The farmers from the arid and semiarid zones asserted that there has been a high rainfall decrease, that is, 83% and 80%, respectively, compared to those from other AEZs, who (70%) mainly mentioned that rainfall has been decreasing (see Table 5). The same pattern was observed when 68% and 65% of the farmers from the villages of Ikoma and Chikuyu, respectively, mentioned that temperature has been increasing. (...) Those with the longest experience were good sources of climate information compared to those with less experience. Significantly, many farmers expressed some observation of recent changes in onset of rainfall and cessation. About 42% and 51% of those with experiences of 20–39 and >=40 years, respectively, asserted that these particular changes have been more pronounced in recent years. Further, the incidences of increased droughts and floods were almost equally asserted (at 38%) by all farmers across all the groups. This was also applied to the recent alterations of temperature."

10	Farmers' perspectives: Impact of climate change on African indigenous vegetable production in Kenya	Chepkoech, W.; Mungai, N.W.; Stöber, S.; Bett, H.K.; Lotze-Campen, H.	International Journal of Climate Change Strategies and Management	2018	10.1108/IJCCSM-07-2017-0160	"AIV farmers in Kenya have perceived a notable change in climate in recent years across the study areas (Tables III and IV). The three ACZs differ from each other with respect to ecological and climatic conditions, but also with respect to CC scenarios. Extremes in temperatures have mostly been reported by farmers. In the humid zone, for example, farmers agreed that extremes in temperature prevailed in the area both during the day and at night. For instance, farmers reported that "when it is hot, it is extremely hot and when it is cold, it is extremely cold". In the semi-arid zone, farmers particularly noted that temperatures were very high during the day and very low at night (Table III). Approximately, more than 70 per cent had observed an increase in temperatures in all the zones, while less than 23 per cent had perceived a decrease in temperatures in the past 20 years. (...) Farmers in all three zones also reported a change in the amount of rainfall. In the humid zone, farmers' perceptions were that rainfall has increased, whereas in the semi-humid zone and semi-arid zone farmers perceived that the rains had generally decreased over the years and were not sufficient. Erratic rainfall patterns were also reported in all the study areas. In the humid zone (Kakamega), farmers perceived that the rains that used to come regularly during the planting season in previous years have now become more unpredictable. Similar observations were made regarding the onset and cessation of rain in the three zones. In the humid zone, the majority noted that the rain mostly started late and ended early. In the humid zone, farmers furthermore said that "in the 1980s and 90s, rainfall was regular from March to May and July to December, but now the seasons are no longer predictable". Additionally, farmers noted that "long rains are no longer long rains and short rains are no longer short rains, seasons are scattered". (...) Besides season duration, this study revealed that changes in the intensity of the rainy seasons had also been observed in the study areas. More than half perceived that the intensity of the rainy seasons had increased in the humid and semi-arid zone, while only 34 per cent had perceived this in the semi-humid zone. It is notable that many farmers observed that the rains were unpredictable/unreliable, with clear changes in rain onset. More than half of the farmers noted that rains started late. For example, in the semi-humid zone (Nakuru), the majority of the farmers agreed that "in the past, rain started in March and ended in August, but now it starts in late April and ends in June" (Table III). Other results from this study also revealed that farmers have observed clear changes in rain cessation. There was an overall agreement by more than 60 per cent of the farmers that the rains ended early, while less than 26 per cent in each of the zones perceived that they ended later. (...) The interviewed farmers notably observed an increase in the frequency, duration and intensity of dry spells. More than half of the farmers in the semi-humid and semi-arid zones perceived that the frequency of dry spells had increased, while 36 per cent from the humid zone did so. Over half the farmers in the humid and semi-arid zones perceived that the duration of dry spells had increased, while 30 per cent in the semi-humid zone did so. (...) Overall, more than half of the interviewed farmers had also experienced droughts (Table IV). Approximately 30 per cent of them perceived that the frequency of droughts had increased, while the remainder perceived that it had decreased. In the semi-arid zone (Kajiado), farmers agreed that the most recent drought occurred in 2014 and was very severe. (...) The interviewed farmers also confirmed that hailstorms were common in the humid zone. According to the farmers, the number of storms had increased over time, resulting in flash floods that wash away their crops. They mentioned that "short rains turn into hailstorms that come with strong winds and destroy our crops, including vegetables" (Table III). (...) In the humid zone, farmers stated that they had experienced frequent floods caused by heavy rains, leading to waterlogging problems. In the semi-humid region, only 20 per cent of farmers had experienced flooding. In the semi-arid zone, they stated that sometimes the rainfall is very high and causes floods. For instance, farmers mentioned that rainfall in 2012 and 2013 resulted in floods because it was too heavy."
6	Climate variability, perceptions of pastoralists and their adaptation strategies: Implications for livestock system and diseases in Borana zone	Ayal, D.Y.; Radeny, M.; Desta, S.; Gebru, G.	International Journal of Climate Change Strategies and Management	2018	10.1108/IJCCSM-06-2017-0143	"The majority of participants (78 per cent) perceived the increasing trend of indicators of temperature from time to time in their localities. As depicted in Table III, participants felt the highest temperature increase during the hot dry season followed by the main rainy season. During FGD and key informant interview sessions, participants underscored the increase in temperatures during the day and night time in all seasons. (...) The majority of respondents perceived that seasonal and annual rainfall amount and number of rainy days has been decreasing, while drought frequency and severity increased from time to time in their localities. Likewise, Table III illustrates that most of the respondents observed seasonal and annual rainfall distribution were erratic in its onset and cessation. (...) In general, the majority of respondents are aware about the existence of climate variability. They explain their experience on climate variability using the rising of seasonal and annual temperature, reduction of the volume of annual and seasonal rainfall, increment of drought frequency and severity. FGD and key informants underscored the changing climatic conditions in their localities particularly in the last two decades, which in part triggered the proliferation of livestock diseases. Due to the changing climatic condition, the scale of diseases prevalence and its adverse impact is increasing. New livestock disease types have also emerged in their localities. (...) Key informants explained that more frequent drought, rising temperature, reduction in the volume of rainfall and the unpredictability in the onset and cessation of rainfall coupled with non-climate stressors such as population pressure, rangeland deterioration and weakening of traditional rangeland management system; remain responsible factors for depletion of water and pasture resources in the study sites. The cumulative effect is mass death of livestock because the conditions create favorable condition for vectors. This in turn debilitates the physical condition of livestock due to water and pasture shortage."
6	Indigenous Adaptation Practices for the Development of Climate Resilient Ecosystems in the Hail Haor, Bangladesh	Monwar, M.M.; Mustafa, M.G.; Khan, N.A.; Hossain, M.S.; Hossain, M.M.; Majumder, M.K.; Chowdhury, R.M.; Islam, M.A.; Chowdhury, M.;	Global Social Welfare	2018	10.1007/s40609-014-0014-9	"Impacts of climate change on local community were assessed by questioner's survey during the study period (Fig. 3). Less income (90 %) was identified as major impact of climate change followed by reduced fish availability, 80 %. About 70 % respondents identified reduced fish diversity, reduced migratory bird's availability, decreased crop production, and food crisis as the impact of climate changes. On the other hand, reduced aquatic plants availability, sudden floods, increased storm, and decreased water-retaining capacity of beels and haor were identified as climate change impacts by 60 % of the respondents. Half of the total respondents (50 %) mentioned increased drought, temperature rise, and drying of water supply canal as the consequences of climate change, where rainfall patterns and increased fish disease scattered during winter season was identified by 40 %. Very few respondents (20 %) identified increased human viral diseases and introduction of unknown paddy diseases as climate induced impacts."
2	Farmers' perceptions about climate change vulnerabilities and their adaptation measures in District Swat	Bacha, M.S.; Nafees, M.; Adnan, S.	Sarhad Journal of Agriculture	2018	10.17582/journal.sja/2018/34.2.311.326	"Perceived causes of climate changes (Figure 4) show that cutting down of forests was the most common cause of climate change which indicates the extent of deforestation in the study area. Other anthropogenic causes of climate changes included pollution (general), greenhouse gases, combustion of fossil fuels, and industrial pollution. Respondents also pointed out some specific forms of pollution including emissions from traffic/cars, planes, carbon dioxide and agricultural processes. In Shamozai, 31.1% of the respondent stated that the main cause of climate change is the deforestation, however, in Ghaligay and Barikot, majority of the respondents (29.2%, 15.6%, respectively) mentioned pollution and natural weather variations as cause of climate change. (...) Interview results of the local communities indicated different perceived impacts of climate change in the study area (Figure 5). Majority of the respondents in the study area reported floods as the major impact of climate change, particularly in Barikot (22.6%). The other major reported impacts included droughts, erratic rainfalls, impacts on agriculture, increase in warm days, decrease in in cold days and water shortages. Majority of respondents from Ghaligay mentioned droughts or erratic rainfall (16.3%), floods (14.7%) and impacts on agriculture (12.8%) as the impacts of climate change. Apart from floods, respondents from Shamozai reported decrease in cold days (11.1%), droughts or erratic rainfalls (10.3%) and glacier melt/retreat (10.2%) as perceived impacts of climate change. (...) The local communities mentioned that climate of the area has changed considerably compared to the past 20 years and the respondents holds the opinion that mean annual and seasonal temperatures have changed considerably. According to the elders of the area, the winters were more severe, and summers were mild 20 years ago but now the winters are not severe anymore and the summers are warmer than the past. Temperature has risen since the past decades and now the locals observe warmer seasons than ever. Moreover, the number of winter days have decreased, and the summer months have extended. One of the respondents from Shamozai and Ghaligai expressed their views that "the temperature is quite increased in district Swat and now there is no difference between the (temperature of) Swat and plain areas anymore" and "Weather has changed. Ten years ago, we were experiencing cold till the month of May but now, we observe warm weather in April. In the past we had cold season after August but now we cannot see any change in the summers till September and October. The weather is changed now, obviously." Likewise, the rainfall pattern in both the seasons have also changed. According to the respondents, the long-wet spells of the winters have decreased while the monsoons are more erratic causing flash floods and riverine floods in the area. About the rainfall, the respondents reminded that they have observed rainy spells called "Jarai" spread over weeks in the past while there is no such thing existed now because there is a visible change in rainfall pattern. Rainfall is more erratic now compared to the past decades. Respondents from Barikot stated "There were no floods before. When it rained before it wasn't damaging. We now experience extreme rainfall with storms which sometimes causes floods", "Weather was very cold before. Snowfall was much more in the past. Summers have gotten worse now. The weather is changed now" and "I have experienced change in rainfall pattern in both the summer and winter season. In winters we had rainfall spells that lasted more than a week or two but now these spells have receded, limiting to 2 or 3 days only. Similarly, the monsoons in summers have changed".
6	Climate change adaptation strategies and food productivity in Nepal: a counterfactual analysis	Khanal, U.; Wilson, C.; Lee, B.L.; Hoang, V.-N.	Climatic Change	2018	10.1007/s10584-018-2214-2	not applicable

6	Evaluation of small-scale fishers' perceptions on climate change and their coping strategies: Insights from lake Malawi	Limuwa, M.M.; Sitaula, B.K.; Njaya, F.; Storebakken, T.	Climate	2018	10.3390/cli6020034	"Even though the study revealed high species diversity, all fishers interviewed acknowledged been exposed to extreme weather events. The fishers reported increased incidences of drought (32%), erratic rainfall (32%), extreme hot temperatures (22%), persistent Mwera winds (strong South easterly winds affecting Lake Malawi due to the flat and obstruction-free nature of its surface, allowing winds of considerable strength to develop. The onset of a Mwera can be quite sudden, causing rapid deterioration in the condition of the lake itself) (11%) and flooding (8%). Most of these fishers (88%) revealed experiencing these extreme weather events in the 21st century. These events occurred frequently in the years between 2000 and 2016, as reported by 89% of the fishers. The majority of the fishers (90%) acknowledged experiencing continuous drought incidences. However, in the last 5 years, about half (44%) of the respondents cited no flooding event in the study area. Apart from being erratic, rainfall was also reported to have reduced in intensity (94%). The reduced intensity might have resulted in drier years in the 2000s, as cited by most respondents (95%), in comparison to the 1990s. These results suggest that the perceived exposures revolved around precipitation and temperature. An analysis of discussions from qualitative interviews revealed that climate change is defined differently between respondents. The definitions were affected by the time lived in the area, which affected how the fishers perceived the changes. For example, there were variabilities in responses by different age groups based on the way they had experienced different changes related to extreme weather events. The older people recollected past events over a long period through experiences and oral tradition, whereas the young fishers lacked the long-lived experiences but their recollections were also based on information passed down to them through oral tradition. Most of the oral tradition was bound by cultural beliefs as alluded to by one fisher, aged 67 years old, during a focus group discussion: " . . . . . In the past with such frequent occurrence of droughts, the elders of the clan would go and seek advice from the medium spirits and God. Droughts and floods were a form of punishment of some sort, but currently things have changed and believing in medium spirits was outdated, it is all about churches and praying to God . . . . . ". (...) An example was also given for the lake level changes, as an indication of lower precipitation and extremely hot temperatures. The respondents cited that the place where we were conducting our interviews, which was 50–100 m from the shoreline, used to be underwater, but over the last 20–30 years, it has become dry land. In addition, some fishers have built houses in that area. " . . . .If it was not for the drying of the lake we would not have a place to build our houses because we migrated to this area as fishers and getting land to settle as migrant fishers, is very difficult . . . . . ." On the other hand, during a key informant interview with a male fisher on 15 November 2015, he reported "By now 30 years ago, we should have planted crops and the rains would have been falling with good intensity. Currently, it is very hot and dry and people are not even sure as to when the rains will fall".(...) The majority of the fishers (89%) reported that the change in climate was the main driver of low fish catches and species composition changes. However, some fishers (10%) attributed low fish catches to overfishing and God's plan (1%). The specific extreme weather events cited by the respondents as being responsible for low fish catches were increased incidences of drought (29%), erratic rainfall (29%),Mwera winds (27%), extreme hot temperatures (11%) and flooding (5%). The majority (68%) of the fishers were experiencing changes in fish species composition and sizes compared to last 20 years. For example, some fishers reported that C. virginalis (31%), E. sardella (26%) and Oreochromis species (20%) used to bemore important fish species in Nkhotakota 20 years ago compared to their present status."
6	Assessing climate change vulnerability and local adaptation strategies in adjacent communities of the Kribi-Campo coastal ecosystems, South Cameroon	Evariste, F.F.; Denis Jean, S.; Victor, K.; Claudia, M.	Urban Climate	2018	10.1016/j.uclim.2017.12.007	"Based on community perception and evidence, different villages experience different level of risks. All respondents reported that rain storms occur in their village during the transition periods between rainy and dry season. They also mentioned flooding, salt water intrusion, coastal erosion, drought, changes in seasons. Rain storms was the most cited risk experienced by respondents, while changes in seasons was the least cited (Table 2). The villages Ebunja I, Mimbosso, Mpalla and Nziou recorded the highest number of threats reported. However, though some of the respondents in study villages say they are worried about these threats, they often do not clearly relate those phenomena to climate. Coastal storms and severe flooding for example is perceived as a consequence of the anger of the gods of the sea. (...) The level of climate change awareness is still low among the communities. There is a poor access of household to climate information sources (Fig. 6). The very few information they obtain from locally operating NGOs, TV and radio broadcasting are limited to sensitization messages on the adverse impact of climate change, and rarely on weather information or adaptation/coping mechanisms."
12	Phenological cues intrinsic in indigenous knowledge systems for forecasting seasonal climate in the Delta State of Nigeria	Fitchett, J.M.; Ebhuoma, E.	International Journal of Biometeorology	2018	10.1007/s00484-017-1495-x	"Thus, the community demonstrated considerable awareness of meteorological conditions and phenological mentioned most often, mentioned most often by the Uzere community, 'swamp chicken' (moorhen) calls were mentioned with the second greatest frequency, cited most often by the Olomoro community (Fig. 2). Very few respondents from Igbide mentioned plant or animal phenological events as indicators for changes in the timing or amount of rainfall in the forthcoming season (Fig. 2). events, and the inter-relationship between the two. The majority of respondents from all three communities mentioned meteorological conditions, specifically observations of thick dark clouds and thunderstorms early in the rainfall season, as indicators of an early start to the rainfall season (Fig. 2). However, as rain would already be occurring at this point, these do not afford forward-planning and adaptation for an above- or below-average rainfall season, nor flooding or drought in low lying regions. Notably, more than half of the respondents from the Uzere and Olomoro communities mentioned early spring plant phenology indicators, including leaf emergence in rubber trees and cassava crops, as indicators of earlier rainfall in the following season (Fig. 2). A smaller proportion of respondents from Uzere and Olomoro also mentioned animal phenology indicators; croaking of frogs was mentioned most often, mentioned most often by the Uzere community, 'swamp chicken' (moorhen) calls were mentioned with the second greatest frequency, cited most often by the Olomoro community (Fig. 2). Very few respondents from Igbide mentioned plant or animal phenological events as indicators for changes in the timing or amount of rainfall in the forthcoming season (Fig. 2)."
6	Analysis of observed and perceived climate change and variability in Arsi Negele District, Ethiopia	Mekonnen, Z.; Kassa, H.; Woldeamanuel, T.; Asfaw, Z.	Environment, Development and Sustainability	2018	10.1007/s10668-017-9934-8	"In this regard, both sources underlined that there was clearly climate change and variability in their village as compared to 30 years ago. They perceived this change in terms of variation in temperature and rainfall. They characterized the variation in rainfall as declined in amount, discontinuous in distribution and erratic in its onset and ending. Regarding the variation in temperature, it was indicated as it has been increased to the extent they felt it as they could not wear clothes which they used to wear before. The respondents explained the variation in climate change with respect to three different periods. These periods were the periods in which three different regimes in Ethiopia existed. The first period was the period called Imperial (pre-1974), the second period was when the Dergue (Military committee) government took power (1974–1991), and the third period is the period the incumbent regime/EPRDF (since 1991). In this regard, they indicated that the climate was better during the Imperial than the Dergue and was better during the Dergue than the present, they added. Even in the year 1984, which was called the drought year in Ethiopian drought history, there was slight rain in summer, but nowadays the drought and intensity of heat have become more severe than that, the witnesses supplemented. The key informants and focus group members asserted that the rain season was longer and its distribution was uniform in the past than nowadays. The responses of group discussion and key informants were similarly reflected in individual household interview (Table 1). These farmers' perception of increasing temperature and declining rainfall is similar to the observed trends discussed in the previous sections except that farmers give more focus on the distribution of rainfall rather than the total amount that can be downpour at once. Besides, people in group discussions have described that a small rain for continuous 10 days is better for crop growth than a heavy rain for only 1 or 2 days. Farmers have recognized the variations and changes in climate by cognitive learning, awareness given by different communication tools as well as from indigenous knowledge. For example, about 98.4% of respondents perceived the existence of climate change and variability by feeling warm due to increased temperature than usual (Table 2). (...) The role indigenous knowledge with respect to climate variation and change prediction is known to be very important in the area. That is, the communities in the study area, especially elders and local Aba Geda—traditional leader of the Oromo community—have accustomed to several indigenous knowledges to predict climatic situations (Table 3). (...) The change in cropping calendar is indicated as one of the evidences for climate change and variability in the study area. (...) Regarding causes of climate variability, the respondents suggested that the rainfall decline followed the decline in deforestation/forest cover and the decline in forest cover followed the increase in population and agricultural expansion; the temperature has increased due to the shift of warmer (lowland) climate into the highlands; industrial expansion in nearby towns and other areas as we learnt from extension and radio, but do not know the scientific bases; and the other cause is, as we believe, is natural phenomena (Fig. 8)."

6	Farmers and policy-makers' perceptions of climate change in Ethiopia	Hameso, S.	Climate and Development	2018	10.1080/17565529.2017.1291408	"According to the survey data, over two-third of respondents (76%) perceived climate change (Fig 2). Among specific risks and indicators of change, 96% of the respondents recognised late onset of rainfall, 93% recognised erratic rain and 88% recognised less rain. Floods from heavy rainfall is recognised by 71% of respondents. Higher temperature is perceived by 84% of respondents. The spread of mosquitoes (hence malaria) is recognised by nearly half (49%) of respondents. (...) The most common indicators are higher temperature, erratic rainfall patterns and higher incidence of diseases. Farmers' perceptions about temperature differ among agroecological sites. Farmers at higher elevations noted an increase in temperature. For instance, FGD participants in the highland thought that their land was gradually drying: 'The sun has turned our highland to dry midland'. Similarly, farmers in the midlands reported not only drought conditions but also decline in river levels and underground water. They felt that drought got stronger and was sustained with significant impact on their livelihood including lost crops. More interestingly, while farmers in the midlands and lowlands had experienced higher temperature and declining moisture, those in the highlands were more articulate about perceived indicators of climate change than its causes and mitigation. The perception of climate change as manifested in seasonal variability is common to all ecological zones. Participants reported that rain used to start in January or February in the past, but it moved to April-May in recent times. Indicating the late onset of rain and changes in cropping calendar, a farmer from the midland recalled: 'While we used to plant enset and maize in January and February in the past, today planting the same moved to April or June.' (...) Local experience and knowledge meant that farmers established seasonal calendars to predict times to prepare land, plant and harvest. Yet given the extent of changes in seasonal patterns, relying on past experience and indigenous knowledge alone cannot help fully predict changing seasonal scenarios. This problem is worsened by erosion of knowledge and interest on environmental concerns among young generations. The third factor of climate change perceived by farmers is high incidence of diseases. The survey data shows that the highlanders are particularly alarmed by the incidence of mosquito spread (see Fig 3).(...) While some indicators of climate change are commonly perceived in all agroecological sites, respondents in some areas reported facing distinctive climatic challenges. For example, participants from the highlands highlighted change in wind direction, disappearance of plant (crop and tree) species, growing new crops such as maize and coffee and emergence of new parasites and weeds. (...) The change in wind direction and intensity is also reported. The immediate explanation for such change is decline in forest cover albeit in mountainous terrain. A participant summarised the wind condition as follows: In highly unknown ways, change happened in manners that harm our area (…) It does not wind the way it used to (...). It does not wind the way we knew. In the past, the wind was heavy…. But it was not harmful (...) It would not destroy anything. … Today's wind, however, causes damage to people. Its behaviour is not known. When rain appears on the horizon without signals, the wind disperses it across the land and we don't enjoy abundant rainfall. (Participant from highland).(...) In general, farmers' explanations about the causes of climate change focused around cultural, religious and environmental causes. Only the latter explanations support the climate science view that climate change is man-made. The common explanations in all study sites were weakened indigenous practices and values, God's wrath, human activities and deforestation, which will be discussed below. Weakened indigenous practices and values as the cause of climate change is an important dimension of farmers' perception of the causes of climate change. Participants repeatedly mentioned the erosion of respect for customary norms and values, protection of trees, paying sacrifice and praying for rain, use of indigenous crop seeds and strategies to cope with disasters and adjust to changed times. (...) Farmers in Sidama did not only indicate decline in cultural practices, but also identified the termination of indigenous practices that were once called upon to resolve natural disasters including drought.(...) Results also espoused generational dimension to perceptions of climate change. For instance, a participant from the midland remarked about the skills and knowledge of old generations. 'Our predecessors had astrologists who examine the arrangement of stars and predict the arrival of rain or otherwise. Today's generations abandoned age old traditions and follow gospel, both young and adults.' Another participant complemented the above view: 'They see the sky and cloud formations. They sacrifice on fateful dates. Then it rains. They also see the direction [and speed] of wind. But today, people are accustomed to modern religions and they abandoned all that' (Participant from the lowland). (...) Reference to God appeared in all FGDs. According to a participant from the highland: 'This climate change, when we think about it, is an act of God.' Another participant added 'I am of the opinion that what is happening is due to the wrath of God'. (...) A few participants held the view that climate change is the work of man. With reference to deforestation, one participant from midlands admitted: '… the mistake is ours only. (...) Participants in all AEZs identified deforestation as a cause to climate change."
26	Smallholder farmer perceived effects of climate change on agricultural productivity and adaptation strategies	Makuvaro, V.; Walker, S.; Masere, T.P.; Dimes, J.	Journal of Arid Environments	2018	10.1016/j.jaridenv.2018.01.016	"Farmers' responses to possible effects of projected climate change showed that they were concerned about crop and livestock productivity as well as availability of water resources, food and nutrition security and about their general well-being (Box. 2).(...) The farmers' envisaged effects were only negative and there were no marked differences in the nature of responses across the three categories of farmers. However, it appears the rich farmers showed greater concern for livestock than the other groups by mentioning effects on livestock first and by elaborating on the nature of livestock losses. This response was expected, given that this group of farmers owned more cattle (at least five head of cattle) than members of other groups. The more elaborate response on climate change effects on livestock by this group could also be because more than half of farmers in this group were younger (between 45 and 60 years). (...) It appears that the predicted increases in temperatures were perceived by farmers to be dramatic as they envisaged severe wilting of crops to occur (resource rich and resource poor farmers). This was probably due to a misconception of the intensity of heat associated with the projected temperature increase by 2050 or limited knowledge of crop response to such a change, on the part of farmers. However, the intermediate (medium) group suggested that wilting of crops would occur if fertilizers were applied to the crop. Farmers also mentioned that climate change would reduce crop yields (intermediate and resource poor groups) and cause seed losses (intermediate farmers). (...) According to the farmers' perceptions, it is submitted that climate change would impact negatively on their well-being through increased poverty, hunger and starvation, increased prevalence of diseases and malnutrition as well as increased cases of school drop outs.(...) Similar to communities elsewhere in the world, and Africa in particular, responses by farmers in Lower Gweru indicated that farmers already knew that there are generally vulnerable to current climate variability and the expected climate change will worsen their situation."
6	Whose knowledge matters in climate change adaptation? Perceived and measured rainfall trends during the last half century in south-western Tanzania	Pauline, N.M.; Grab, S.	Singapore Journal of Tropical Geography	2018	10.1111/sjtg.12232	"Most farmers from Ibohora village (97 per cent) have perceived a change in rainfall and temperature patterns over the past four decades (Table 3). When asked about observed changes, farmers highlighted that temperature is increasing, water for domestic and irrigation purposes is increasingly unreliable, there is a high frequency of droughts, rainfall quantity is decreasing, there is an increase in mid-season dry spells, rainfall is becoming intense and patchy, and the onset of rainy/growing seasons is increasingly unpredictable and, in most cases, starts later than normal. The majority of farmers (88 per cent) from Ibohora village report that in recent decades, rainfall frequency (i.e. number of rain days) during the rainy season has been decreasing. However, 55 per cent of farmers also report that rainfall intensity has increased since the early 1990s. One farmer explained that 'during the 2010/2011 growing season it rained for only 27 days in total (from November 2010 to May 2011). It was raining on one day and followed by a dry spell of several weeks until the crops wilted, then it rained again'. Farmers' perceptions in Ikuvala village are largely associated with the daily challenges they face, such as unpredictable rainy seasons, frequent droughts, intensive rains, increased temperature, poor quality of drinking water, a lack of water pools in the lowlands until May, and strong winds. Results indicate that only 44 per cent of farmers perceive that there has been a change/variability in climate during the past four decades (Table 3). It thus seems that farmer perceptions are strongly contrasting in their views about climate change, even within the same community. According to 42 per cent of farmers in Ikuvala village, the frequency of rainfall during the growing season has decreased, and 30 per cent of farmers reported that the intensity of rainfall has increased since the early 1990s. Only 36 per cent of farmers perceive that rainfall patterns are unpredictable, inconsistent and increasingly becoming patchy. One farmer narrated that 'during the year 2008, the rain started in the highlands only, so those with farms on the mountain slopes began to cultivate, whilst it took a further three weeks for the lowland farmers to receive their first rain. The trend was reversed during the following year (2009) when the lowlands received rains three weeks earlier and started to cultivate'. A large percentage of farmers in Ruaha Mbuyuni village (73 per cent) perceive that there has been a change in climate during the past 40 years (Table 3). Fifty-nine per cent of farmers reported that rainfall frequency during the growing season has decreased, while 36 per cent of farmers feel that the intensity of rainfall has increased since the early 1990s. One farmer narrated that 'after El Niño (1998), the amount of rainfall started to decline progressively, and hence they started to diversify crops by growing sunflower which is drought tolerant'. Another farmer highlighted that 'rains were good up to the mid-1990s; thereafter rains became unpredictable with frequent droughts except in 1998'. As with Ikuvala village, only 39 per cent of farmers consider rainfall patterns to be unpredictable, inconsistent and increasingly becoming patchy. However, when communicating through focus group discussions, farmers were generally of the opinion that the onset of rainy seasons has become unpredictable and that the intensity of rains and frequency of droughts have increased during the past 20 years. Farmers recall some years with high intensity rains (e.g. 1998 and 2008) which led to the destruction of river banks and even caused river channel adjustments. (...) Farmers recalled one extreme wet rainy season during the 1997/1998 El Niño, which caused floods in many parts of East Africa (Figure 2). Farmers from Ikuvala village remember (perceive) some past years as extremely dry due to insufficient rain during the growing seasons; these years include 1970, 1981, 1999, 2006 and 2007. Farmers recalled only one growing season (1997/1998) which had abundant rains but caused floods in many parts of Tanzania – coincidentally this was an El Niño year (Figure 2). In contrast, farmers in Ruaha Mbuyuni village recounted 1975 as the driest year remembered ('dead dry'), when apparently all crops failed. Yet, heavy rains with floods were remembered for the years 1998 (El Niño) and 2008 (Figure 2)."

10	Agro-pastoralists' determinants of adaptation to climate change	Kgosikoma, K.R.; Lekota, P.C.; Kgosikoma, O.E.	International Journal of Climate Change Strategies and Management	2018	10.1108/IJCCSM-02-2017-0039	"The farming community in Kweneng had observed several indictors and impacts associated with climate change (Table II). The majority of the respondents in the study indicated that the temperature and the number of hot days have increased over the past 10 years by 97 and 91 per cent, respectively. Almost all farmers in Kweneng have also observed decline in rainfall, and 95 per cent of them have noticed a decrease in rainfall days. Most agropastoralists in Kweneng were concerned with reoccurrence of drought, particularly that their observed trends indicated increased drought frequency. Based on most farmers' perceptions, flood occurrence has not changed much in the past 10 years. The observed changes in climatic conditions reported by farmers were associated with reduced crop and livestock productivity. Farmers attributed decreased crop and livestock productivity to several stressors associated with climate change. Most farmers identified drought and low rainfall as the major risks to agricultural productivity (Figure 1). In addition, high temperature was reported to cause poor growth of crops and livestock because of heat stress. A moderate proportion of farmers mentioned pests and diseases as climate change stressors that result in reduced agricultural productivity. Poor vegetation was mentioned by only a negligible proportion of Kweneng farmers as a climate change stressor that leads to decline in crop and livestock productivity."
6	Perceptions of climate and ocean change impacting the resources and livelihood of small-scale fishers in the South Brazil Bight	Martins, I.M.; Gasalla, M.A.	Climatic Change	2018	10.1007/s10584-018-2144-z	"Sea level changes were perceived in Itaipu, Ilha do Araújo, Boqueirão do Sul and Pontal de Leste, where some noted that the sea level had risen, while others said it had dropped (Fig. 2a). Perceptions of reduced rainfall were unanimous in Boqueirão Sul and Bonete and shared by approximately three-quarters of fishers in Ilha do Araújo, Mandira and Pontal de Leste (Fig. 2b). Fishers perceived that the wind had changed in recent years, but there was no clear pattern to the answers (Fig. 2c). Most fishers from Itaipu, Ilha do Araújo, Bonete, Boqueirão Sul and Mandira perceived an increase in atmospheric temperature, while approximately half of the fishers in Enseada and Pontal de Leste had the same perception (Fig. 2d). A change in the coastal currents was perceived in only Boqueirão Sul, where one-quarter of the fishers said that the currents had decreased in strength (Fig. 2e). The majority of fishers perceived that the sea is currently calmer than it was in the past. However, this perception was not shared by the fishers in Mandira, which is located within the Cananeia-Iguape estuarine complex (CIEC). Itaipu, Bonete and Boqueirão Sul are the communities that are most exposed to wave action, and they had the highest number of fishers that perceived that the sea is calmer (Fig. 2f). The SST has increased according to the perceptions of the fishers. Most of the perceived increases were from the fishers from the southernmost communities, with more than half in Boqueirão Sul and Pontal de Leste (Fig. 2g). Fishers from Ilha do Araújo and Enseada perceived a decrease in ocean column temperature, suggesting a possible stratification in these areas, with warm water on the surface and cold water at the bottom (Fig. 2h). The perceived changes have positively and negatively impacted the livelihoods of the fishers (Table 2).(...) Fishers from all communities recalled a large storm over the last five years, but the numbers of fishers affected were higher in Ilha do Araújo and Pontal de Leste (Fig. 3a). Drought events were perceived by most fishers from all communities except Itaipu, and the direct impacts were higher in Boqueirão Sul and Pontal de Leste (Fig. 3b). Shoreline changes were perceived by nearly all fishers in Boqueirão Sul and Pontal de Leste and by approximately half in Ilha do Araújo and Mandira, but fishers were directly affected in only Ilha do Araújo and Pontal de Leste (Fig. 3c). Floods were reported in only the Bonete community, but they had not had a direct impact on any of the surveyed fishers despite the frequency (Fig. 3d)."
6	Climate variability/change and attitude to adaptation technologies: a pilot study among selected rural farmers' communities in Nigeria	Ayanlade, A.; Radeny, M.; Akin-Onigbinde, A.I.	GeoJournal	2018	10.1007/s10708-017-9771-1	"What is obvious from questionnaire analysis is that the majority of farmers note changes in the patterns of rainfall and temperature. A good proportion of the respondents has been engaged in agriculture for a significant amount of years, which is enough to enable them to appreciate the change in climate over time. (...) Table 3 shows the relative proportions of farmers in each age range and their perception of climate change. In all age range, a majority of farmers indicated that they had indeed noticed climate change. All farmers within the aged of 50 and above indicated that they had observed climate change.(...) When asked if they had noticed a change in the typical start and end date of the rainy season, many of the rural farmers answered ''yes'', while only a few answered ''no'' and some expressed uncertainty (Table 3). These results were validated through the interview when many of the farmers said that they have noticed changes in typical start and end of rain season. It is also obvious from the interview that a vast majority of farmers aware of climate change, as they said that they notice ''more erratic rainfall patterns and risen temperatures''. The result from interview moreover illustrates that the perception of the farmer in term of climate change varies, 72.8% of the farmers responded in the affirmative, 14.9% responded in the negative while 12.3% expressed uncertainty. (...) For change in rainfall and temperature patterns, the majority of the farmers have noticed a significant change in recent years. When asked if they had noticed a general temperature increase over the last 15 years. About 68.9% farmers answered ''yes'', 23% answered ''no'' while 6.6% responded 'not sure' (Table 5). They also noticed a change in the duration of the rainy and dry seasons and their impacts on crop yield. Although there appear to be differing opinions about current rainfall patterns as opposed to past trends. Many of the rural farmers reported a delay in onset of rainfall, early stop of rainfall, high variability in rainfall patterns and some year they noted the earlier start of rainfall (Table 5). During the interview, the farmers reported that changes in climate have high impacts on their crops when they asked the question of if the perceived temperature increase and change in rainfall patterns have impacts on the yield of their crops."
6	Climate change perceptions and response strategies of forest fringe communities in Indian Eastern Himalaya	Dey, T.; Pala, N.A.; Shukla, G.; Pal, P.K.; Das, G.; Chakarvarty, S.	Environment, Development and Sustainability	2018	10.1007/s10668-017-9920-1	"Almost all the respondent perceived climate is changing than what it was 30 years ago. The overall perception of the community toward change in temperature-related events and precipitation is high with average perception score of 0.74 (Table 1). More than 90% of the respondents perceived increase in temperature when they agreed that average day and night temperature has increased (97%), and difference between day and night temp has narrowed down (98%) along with mildness in winter (92%) and warming of winds (99%). But majority of the respondents disagreed that wind storms were getting stronger (90%). Moreover, majority of the respondents were also of the view that intensity and pattern of rainfall have changed (95%) along with decreased cloudy (85%) and rainy days (98%).However, the overall perception of the community toward change in regularity of climate events is medium with average perception score of 0.51 (Table 2). Majority of the respondents believed that rainfall is becoming unpredictable day by day (95%) but disagreed that there is uneven distribution of rainfall (83%) though arriving little late (100%) and withdrawing early (99%) over the past few decades. However, majority of the respondents (89%) had not experienced any increased occurrence of sudden heavy rainfall or storms and cyclone over these decades. Almost all of the respondents perceived (99%) changing seasons and believed that drought, flood (99%) and duration of dry spell have increased (99%) along with decreased duration of winter (95%). But majority of the respondents disagreed that hailstorms occur beyond autumn and spring season (46%). The perception of the forest fringe people that temperature has increased and rainfall decreased over the years or onset of rains is now delayed, while cessation is earlier in line with meteorological trend analysis from recorded climatic data of last 35 years (Fig. 2). The study indicates that overall temperature is increasing, with a multitude of impacts on weather and precipitation and water availability. Less severe winter and advancement of summer and monsoons perceived by the local people indicate that temperature is rising in winter and the duration of winter is becoming shorter. (...) There was consistency of responses for overall warming; early onset of summer and early onset of monsoon suggest widespread awareness among the people of the study area. (...) There was mixed response of respondents on impact of climate change on their livelihood (Table 3) with average livelihood impact perception score of 0.23 which is low. Majority of the respondents perceived that climate change impacts on their livelihood will be through decreased fish catch (97%), decreased NTFP collection (77%) either for medicinal use (72%) or food (71%) and unhealthy or unproductive cattle (97%) which will negatively influence their food and medicinal requirement. However, majority of the respondents did not perceive decrease in fodder (81%) and fuel wood (83%) collection from forest. (...) Having the perceptions like this, it is obvious that most of the respondents (57%) perceived that in event of climate change their livelihood dependency on forest will decrease and their drudgery and misery will increase. As of now due to their economic conditions, they cannot afford for an alternate source/arrangement how it will be possible in the future when they perceive decrease in their income due to climatic changes."

6	Risk perception and adaptive responses to climate change and climatic variability in northeastern St. Vincent	Smith, R.-A.	Journal of Environmental Studies and Sciences	2018	10.1007/s13412-017-0456-3	"Focus group discussions on climate change revealed a limited understanding of its meaning and causes and potential impacts. Some participants indicated that they have heard the concept mentioned on the radio or television programmes, but it was clear that they lack understanding as they were unable to response to questions on what is and what causes it and sought this understanding from the researcher. One individual questioned the relationship between climate change and global warming while another questioned whether it was connected to the ozone depletion. The others had nothing to say on the issue. In spite of this, questions on observed changes in the climate revealed that there is a general perception that the climate is changing. The changes observed include changes in temperature and the length of the dry season and unpredictable weather patterns. It was clear that while local communities might not be aware of the scientific underpinnings of climate change and how it is connected to their local observations, they recognised that the climate is changing. (...) While some respondents (29%) stated that they have observed no change in the climate, a strong predictor of climate change from the questionnaire was increased in temperature (42%). A chi square test revealed a statistically significant relationship between individuals' perception of climate change and the location of the community (p value .000 - significance established at ≤ 0.05). Each community reported similar perceptions of the observed changes in the climate. (...) Majority of the farmers (70%) recognised a change in the climate in terms of temperature increase, longer dry season and the unpredictability of the weather with some reporting that the dry months like May have seen much rain while the hurricane season has seen 'more sun than rain'. This is captured well in the statement made by a farmer who claimed that 'you get rain in between, no straight season'. (...) Many farmers echoed similar sentiments shared by one farmer, 'the most problem we face with market, we face plenty problems with market'. While climate-related events were also challenging, they were viewed as natural events over which they had no control. It was clear they understood the impacts of climate-related events even in the absence of knowledge about the phenomenon of climate change. Still, much of their actions and behaviour appeared to be focused on market which they believed can be managed. (...) The previous discussion show that while farmers did not understand the science of climate change, they recognised increasing variability in the weather which may be interpreted as indicators of a changing climate. They further described the impact of these changes on their livelihoods.(...) Respondents were asked on whether their perceived the location of their home as being at risk to natural hazards. Of the total households, 61% did not perceive where they live as risky, while a moderate but noteworthy percentage (36%) believed they were at risk. (...) While majority of both male and females perceived that the location of their homes was not at risk, within the female groups, there was a greater tendency for them to feel at risk.(...) It also suggests that there is a greater tendency among men to accept some forms of risk.(...) Interestingly, the results also show that persons living in family home (homes that were owned by parents and passed down to children) felt more at risk than thosewho owned home. The reasons might be linked to these persons not being a part of the earlier decisions on where these homes were located. When the results were examined across the communities, it was found that within Sandy Bay in particular, there was a noteworthy proportion of the sample (44%) who believed their homes are located in a risky area. Field observations show that Owia and Fancy are located on the steep hilly areas of the villages while in Sandy Bay, they occupied more gently sloping terrain with greater exposure to coastal elements. An examination of the reasons why persons believe their homes were at risk were mainly related to coastal hazards such as 'high seas' (storm surge) which was suggested in the response 'live along the coast', landslides, strong winds and river flood (see Fig. 2). Landslide was identified by majority of respondents and is in keeping with national data which shows that the northern communities are highly susceptible to its impact (see Fig. 3)."
6	Signs of Climate Warming Through the Eyes of Yak Herders in Northern Bhutan	Wangchuk, K.; Wangdi, J.	Mountain Research and Development	2018	10.1659/MRD-JOURNAL-D-17-00094.1	"Herders' perceptions of climate change are presented in Table 1. The majority of respondents were aware of the changing climate. When asked to compare the current climate to that of 15 years ago, the vast majority of respondents agreed that temperatures have risen and the climate is warmer at present. According to a large majority of respondents, this has led to a gradual change in the environment over the last 15 years. Most respondents perceived that weather patterns are changing; the vast majority agreed that the weather was worsening and becoming more unpredictable and was likely to worsen further in the future. Regarding the signs of changing climate, most respondents agreed that snow and glaciers are melting faster, causing the snow line to ascend. The majority of respondents said that the frequency of landslides and flash floods has increased and the warm period has become longer. Many also said that water sources are drying gradually and water availability has declined. Despite agreeing that the amount of rainfall has increased, the vast majority of respondents said there is increasing water scarcity due to warming and soil fertility has declined. Over half of the respondents said that the changing climate and warming have led to more droughts and desertification; less than half perceived that the tree line has ascended. Respondents were divided on whether warming has led to changes in the amount of soil moisture content and number of lake outbursts. Respondents felt that the frequency of hailstorms has not increased. According to less than half of the respondents (statistically not significant), the size of rivers is perceived to have decreased. Yak herders' perceptions of the impacts of warming on vegetation are presented in Table 2. Many agreed that the barren lands are gradually being colonized by plants. Grassland size and fodder availability were perceived to have decreased. According to over half of the respondents, rhododendrons are encroaching on alpine meadows at a faster rate and forage quality has declined. Just under half reported that vegetation has started to grow faster, yet no new plant species have been found in the meadows.Table 3 shows respondents' perceptions of the impact of warming on herding. According to most respondents, climate warming has made herding difficult. Yaks were reported to feel discomfort during transhumant migration and livestock health is declining. (...) Table 4 presents the perceived impact of warming on herders' livelihoods."
16	Indigenous understanding of climate change, impacts and coping strategies in a rural setting of Kwara State, Nigeria	Tunde, A.M.; Ajadi, B.S.	Geography, Environment, Sustainabili	2018	10.24057/2071-9388-2018-11-4-85-99	"All farms surveyed reported climate-related heat stress to livestock, livestock water shortages related to rainfall pattern especially in the northern senatorial district of Kwara State covering Kaiama and Patigi communities. The local people have also understood that the unusual early rains that are not sustained, erratic rainfall pattern, delay in the onset of rain, long period of dry season, less rainfall, long period of harmattan and higher temperature, heavy winds, drought and decreasing soil moisture have been on the increase. Thunderstorm, heat waves, desertification and loss of forest resources have shown no change, while floods, heavy rainfall and escalating soil erosion have been decreasing with early rain. This was also the same trend for pests, diseases, weeds and signals of land degradation such as declining soil fertility and drying up of streams/rivers such are the cases with other parts of Nigeria in the face of varying climate."

6	Smallholder farmers' insight on climate change in rural Ghana	Odame Appiah, D.; Akondoh, A.C.K.; Tabiri, R.K.; Donkor, A.A.	Cogent Food and Agriculture	2018	10.1080/23311932.2018.1436211	"In the study communities, respondents claimed that evidence of climate variability and climate change and its adverse effects on crop production is increasingly being felt. They reported that erratic rainfall pattern, windstorms, increase in temperature and floods were signs of climate variability and climate change in the communities. (...) These perceptions of respondents on climate variability and climate change are elaborated in Table 3.Erratic rainfall pattern according to respondents is one clear sign of climate variability and climate change in the municipality. Respondents perceived that climate variability and climate change have become unpredictable and it is associated with erratic rainfall. They claimed that rainy seasons could either delay when farmers predict a fall of rains or receive rains when they least expected them. (...) Respondents also indicated, there was observed increase in temperature, as evidence of climate variability and climate change in the municipality. They mentioned that temperatures in recent years have consistently been rising, coupled with prolonged dry weather conditions. Respondents attributed this to the cutting down of trees by chainsaw operators and the forest service division (FSD). The FSD personnel were blamed for granting concessionaires the permit to harvest large volumes of trees, with the consequences of exposing the land to direct sunlight. An interview with some FSD officials revealed that, trees were deliberately cut to replace non-economic trees with economically viable trees. (...) Frequent windstorm is another observed evidence of climate variability and climate change in the communities. Windstorm according to respondents causes severe destruction to crops. They also reported that windstorm has become severe in recent years and usually destroy plantations. According to respondents, windstorm not only destroys plantation but it also destroys houses and other properties.(...) In terms of causes of climate variability and climate change in the study area, majority of the respondents (67%) reported that the removal of vegetation has increased the changes in climatic conditions in the area (Table 4). Another important cause of climate variability and climate change reported by the respondents is bush burning in the municipality. About 18% of the respondents indicated that unguided burning of bush for activities especially agriculture and hunting purposes cause climate variability and climate change. Some of the respondents claimed that frequent bush fires in the area have been a challenge. In Kwapanin for instance, farmers lamented that frequent bush burning has contributed to climate variability and climate change. A woman engaged in agroforestry reported: "Bush fires are rampant in this area. This is caused by careless farmers and bush meat hunters. They set fires and leave it in the bush destroying our farms. The fires also destroy our Cedrela and Teaks and prevent them from growing. I think this is a cause of climate variability and climate change here". According to the farmers, bushfires in the municipality have resulted in deforestation in the area. The farmers also indicated that bushfires in the area have contributed to food insecurity.(...) Furthermore, about 8% of the respondents said that climate variability and climate change in the municipality is also caused by the emission of vehicular and industrial fumes. For instance, respondents from Abofuor claimed that the emission of fumes by a wood factory in the community contributed to the cause of climate variability and climate change in the area.(...) Results from our study indicated that climate variability and climate change in Offinso Municipality has adversely affected crop production in the area. About 26% of the respondents indicated that the adverse impact of climate variability and climate change on crop production is very high whiles 36% of the respondents said that the negative effect of climate variability and climate change on crop production is high (Figure 2).This clearly attests to the fact that the alteration in climate has severely contributed to reduction in crop production in the study communities. Interviews with a group of farmers at Kwapanin, particularly revealed that the impact of changes in climatic conditions in the Offinso Municipality on crop production has been very devastating. (...) Vegetable production in the area has been affected adversely by climate variability and climate change. According to these farmers vegetables such as egg plants and cabbage production have been affected. They indicated that frequent outbreak of pests and diseases have been some of the effects of climate variability and climate change in the area. (...) Generally, farmers in the municipality were familiar with the term "climate variability and climate change". However, the understanding of "climate variability and climate change" and its causes varied widely among respondents and across communities. (...) Irrespective of the level of understanding of climate variability and climate change, the study found a high level of awareness about the effects of climate variability and climate change. Erratic rainfall and increased temperature were the most commonly perceived and therefore, mentioned results of climate variability and climate change among respondents. As impact of climate variability and climate change, loss of agricultural crop, food, health hazards and housing hazards were reported widely. Many of the respondents indicated, their households have already been adversely affected by climate variability and climate change."
16	Farmers perception on climate change and determinants of adaptation strategies in Benishangul-Gumuz Regional State of Ethiopia	Mesfin, A.H.; Bekele, A.	International Journal on Food System Dynamics	2018	10.18461/ijfsd.v9i5.956	"About 85.85% have been observed heavy rainfall while 14.15% of the respondents did not in their locality. Complement to the above fact, about 94.63% of the respondents did not observe very short rain while 5.37% of them did. This indicates that heavy rainfall is the major climate change problem in the crop-livestock mixed farming system in Benishangul-Gumuz region. Moreover, about 48.78 % of the sampled households responded that increased/high temperature is the major problem of climate change. Furthermore, the incidence of diseases and pests is also the big challenge for smallholder farmers in the study areas. It seems logical that with excessive/ high rainfall complemented with increased temperature creates favourable condition for disease and pests. For this reason the humid intermediate and lowland agro-ecological zones of Benishangul-Gumuz region are hot spot for major crop and livestock diseases and pests. Farmers' perception regarding climate change effects are presented at the following table. Perceptions on the effect of climate change mainly due to increased/high temperature and excessive rainfall is indicated at Table 3. The major effects of climate change were hotness of the body (55.61%), other manifestation of rainfall (erratic and heavy during shower season) (49.27%), changing the environment (deforestation and wild fire (33.17%)), heavy rainfall during flowering and seed setting (31.22%) and excessive heating (30.73%) as indicated in Table 2 below. To measure the impact of climate change we use percentage loss due the causes of climate change indicators as a proxy. Thus, crop diseases and pests had caused about 50.56% yield losses; excessive/high rainfall had 39.31% crop yield losses; livestock diseases cause about 27.1 % livestock death. Moreover, drought (late rain-offsetting) variability in rainfall, increased run-off due to high rain fall decreased rain-fall and high temperature had caused about 19.83%, 18.11%, 17.38%, 17.02% and 12.16% yield losses respectively as indicated in Table 4. About 61.95% of the farmers perceived that crop diseases, insects and pests infestation had very negative effects while 49.47%, 35.12% and 23.41% of the farmers perceived that increase in precipitation, livestock disease, and increased risk of drought had very negative impacts on crop and livestock production respectively. Finally, variability (decreased and increased) in precipitation, increased runoff, increased temperature, crop diseases and pests infestation had also negative effects (see table 4). Farmers perception regarding climate change in the last ten and five years is indicated at the table below. The results showed that Increase in diseases, insect pests infestation in the last ten and five years have been frequently happened with a value of 4.38, and 3.13 times on average respectively and followed by increase in precipitation and temperature (see table below). The farmers' perception regarding the long term perception on climate indicators showed that about 46.83% and 41.95% of the respondents revealed that increase in precipitation, increase in disease and insect pests respectively were the major worries for the future. However, it must be noted that majority of the farmers do not respond and replied only Almighty God knows about the future."
10	Perception of and response to climate change by maize-dependent smallholders	Bedeke, S.B.; Vanhove, W.; Wordofa, M.G.; Natarajan, K.; Van Damme, P.	Climate Research	2018	10.3354/cr01524	"Most (96.7%) farmers perceived that overall temperature had increased, 1.9% of farmers recalled it had decreased and 1.5% believed it remained the same over the period 1995− 2015 (Table 3). The proportion of farmers believing that temperature had increased was highest in Offa district (88.1%), followed by Sodo Zuria district (87%) and Humbo district (86%). (...) Over half (63%) of farmers perceive decreasing precipitation volumes (Table 3). The proportion of farmers who perceived precipitation decline was highest in Sodo Zuria district (66.7%), followed by Offa district (61.6%) and Humbo district (60%).(...) Most (60%) farmers (59% in Humbo district, 54% in Sodo Zuria district and 49% in Offa district) recalled seasonal rainfall variability patterns as late start and early end (Table 3, Fig. 3). FGD participants reported that the rainy seasons have become shorter due to a shift in the start of the short rainy season from early March to late April and a shift in the end of the long rainy season from late September to early August (Table 4). They explained seasonal rainfall unpredictability by counting the number of days with rain (e.g. it rains for 3 d in early March, breaks for a week or more, rains again for 4 or 5 d in mid-April, and then breaks for several weeks).(...) Most (75%) farmers perceive an increase in rainfall intensity, 20% reported decreased rainfall intensity and 5% believed it remained the same (Table 3). FGD participants indicated that rainfall volume had become more intense, causing erosion and flooding in lowland areas, particularly in the long rainy season, over the past 2 decades (Table 4). FGDs also revealed that dry spell and/or drought frequency has increased substantially and was responsible for maize yield decline over the period 1995−2015. Although long-term actual maize yield records were not available to analyze trends, findings show that farmers perceive change in extreme climate events such as floods and droughts.(...) Most (61%) farmers who perceive climate trends (i.e. increased temperature, declined precipitation and shortened seasonal rainfall duration) believe that climate change is occurring, and is being caused by human action (Table 3). FGD participants who perceive an increase in drought frequency believe that rapid deforestation is a principal cause of climate change. They also indicated that poor access to electricity has increased household fuel wood and charcoal consumption, leading to increased forest clearing, desertification and drought, and thereby contributing to climate change. Some older participants who did not agree that climate change is linked with human actions put the blame on people that are disobedient to the Bible. Hence, climate change is believed to occur as a punishment from God. This shows that farmers' perception of climate change, to some extent, may be influenced by household age and religious background."

2	A gendered perspective on the fish value chain, livelihood patterns and coping strategies under climate change - insights from Malawi's small-scale fisheries	Limuwa, M.M.; Synnevåg, G.	African Journal of Food, Agriculture, Nutrition and Development	2018	10.18697/ajfand.82.17580	"The majority (>90%) of respondents reported experiencing significant changes in temperature and rainfall (Figure 2). These changes include increased incidences of extreme hot temperatures, late onset of and erratic rainfall, floods and droughts. However, there were no statistical significance differences ($\chi 2$ = 453, df =1, p>0.05), between men and women's perceptions of these changes in the last 30 years. The perceptions of respondents were based on their experiences of long-term weather exposure in the last 30 years [24]. The high average age of respondents (39 years) provided a good platform to support having experienced such changes by reducing challenges, which arise when people interpret trends from a few recent events [25].(...) The majority of respondents (>90%) acknowledged that the rainfall pattern had been erratic resulting in extreme high temperatures. (...) About half of the respondents had witnessed less than three (3) drought incidents attributed to low precipitation, whereas the other half had not witnessed any flooding event. There were no statistically significant differences between respondents' sex and the perceived number of droughts and floods.(...) The responses of men and women from another focus group discussion on effects of extreme weather events on fish availability highlighted how low catches could be attributed to climate related factors: "We are challenged by droughts, up to the extent of skipping meals some days. We have the lake nearby but even to catch the fish is not easy because catching more fish is a factor of getting a lot of rain." (Group discussion to author, Site #2, 2016)."
26	Climate trends, risks and coping strategies in smallholder farming systems in Uganda	Mubiru, D.N.; Radeny, M.; Kyazze, F.B.; Zziwa, A.; Lwasa, J.; Kinyangi, J.; Mungai, C.	Climate Risk Management	2018	10.1016/j.crm.2018.08.004	"Respondents were asked whether they had noted any changes in weather patterns over the last 5 to 30 years. Majority of the respondents reported changes in the weather patterns. Farmers' perceptions of rainfall onset and cessation, amount and distribution of rainfall, and temperature across the two sites are shown in Figs. 3–7.(...) Majority of the respondents (55%) across the two sites reported late onset of rainfall. On average, 40% reported variable onset of rain (oscillating from early, normal or late). Overall, less than 10% of the farmers reported early and normal onset of rains.(...) There were, however, mixed perceptions of rainfall cessation across the two sites. Majority of respondents (81.6%) in Rakai reported early rainfall cessation compared to 35% in Hoima. In contrast, majority of the respondents (41.7%) in Hoima reported late cessation relative to 15.3% in Rakai. Late onset of rainfall coupled with early cessation, as reported by majority of the respondent in Rakai leads to a shorter growing season. This coupled with increasing mid-season droughts, increases the risks in smallholder farming.(...) Majority of respondents, on average 45% reported variable distribution of rainfall, that is, either normal, more in first or second season. This was followed by mid-season droughts, averaging 24.2%. A smaller proportion reported a normal rainfall pattern.(...) Over 85% of the respondents across the two sites reported changes in rainfall amount that is either, less, high or variable (Fig. 6). There were, however, differences in the perceived changes across the sites. While majority of respondents in Hoima (51.7%) reported that the rainfall was variable, in Rakai the majority of respondents (56.7%) reported that the rainfall amount was less. Apparently, from the farmers' perceptions, the two sites receive quite different amounts of rainfall, with Hoima receiving relatively more rainfall than Rakai.(...) Similarly, farmers reported variations in temperatures. Farmers' perceptions of changes in temperature were grouped into four categories: lower, moderate, higher, and variable (Fig. 7). A clear difference in perception across the two sites is evident, with majority of respondents in Rakai (78.3%) reporting an increase in temperature. In Hoima, the proportion of respondents (43.3%) reporting moderate and higher temperatures was equal.(...) Drought, diseases and pests were the most severe climate-related risks, with 90% of the respondents in both sites reporting drought. Disease and pests were reported by 65% of the respondents in Hoima, and 56.7% in Rakai.(...) Crop failure had the greatest impact on crop production among farmers in Rakai (reported by 93.3%) and Hoima (76.3%). Other impacts of climate change such as crop damage, pest infestation and disease prevalence were each reported by more than 45% of respondents in both sites. Similarly, the impacts of climate change on livestock production included lack of feeds, water shortage, low milk production, disease and vector prevalence. Over 80% of the farmers in Rakai reported lack of feeds as one of the major impacts of climate change on livestock production compared to 78% in Hoima."
26	Understanding climate change impacts on water buffalo production through farmers' perceptions	Escarcha, J.F.; Lassa, J.A.; Palacpac, E.P.; Zander, K.K.	Climate Risk Management	2018	10.1016/j.crm.2018.03.003	"Nearly all respondents (99%) had heard about climate change. They perceived climate change as the second most worrying driver of change after financial issues (Table 2). Other problems of concern were declining interest in farming (3rd most important), increasing land conversion to non-agricultural uses (4th), socio-cultural changes (5th) and migration (6th). (...) Farmers interpreted climate change through observed occurrences of extreme events such as typhoons, floods, droughts, extreme rainfall, extreme heat and changing seasonal patterns. Almost all respondents perceived an increase in the frequency and severity of typhoons, increases in extreme rainfall events and the number of dry summer days as part of a changing climate (Fig. 3). Most respondents (about 90%) also perceived an increase in floods and extreme heat. Droughts were perceived as increasing by about 75% of respondents with the other 25% having noticed no change. The number of rainfall days during the wet season was the only climate parameter for which farmers' perceptions seemed to vary. The wet season was perceived as becoming wetter (increasing number of rainy days) by about half of the respondents (53%). Some farmers (29%) thought the wet season had become drier and some did not perceive any changes (18%). Respondents observed that feeds and feeding were highly affected by drought (62%) and shifting seasonal patterns (61%) (Fig. 4) while almost an equal proportion of respondents considered animal health to be affected by typhoons (67%), flood occurrences (49%) and shifting seasons (45%). Notable health related concerns triggered by climatic stresses were the presence of parasites and other infectious diseases. Farmers mentioned liver fluke infection (fasciolosis) as associated with the flood season or if their animals were exposed to irrigated rice farms and communal grazing areas. Some have been dealing with recurring mastitis with a belief that too much heat stress to their caracows could be the cause. Difficulties in breeding animals (decline of animals in estrous and conception rate) were associated by farmers with shifting seasonal patterns (55%) and during periods of drought (63%). Farmers recalled that, during the dry season, it was harder to detect females that are ready to mate, resulting in low numbers of pregnancies. About 80% of the respondents, 80% were milking their animals and extreme heat was considered by many (73%) to affect milk quality. They noted reduced milk volume during hot summer days and drought (55%) with frequent quality rejection upon point of sale. All the extreme climatic parameters were listed as influencing overall production costs, with drought mentioned most frequently (64%). Typhoons (67%) and flooding (49%) often affected logistics (accessibility of roads) and/or marketing (distribution of produce). Farm activities were also hampered. Respondents mentioned stronger typhoons wiped out crops and some had lost animals tethered near rivers to flash floods. Nearly all respondents (98%) stated that their overall production system had been affected negatively by climate change in the past decade."
10	Indigenous knowledge of rural communities for combating climate change impacts in west central ethiopia	Amare, Z.Y.	Journal of Agricultural Extension	2018	10.4314/jae.v22i1.16	"Farmers tend to use a combination of indigenous knowledge and scientific information in their seasonal forecasting, as they primarily rely on indigenous knowledge but are also open to receiving scientific forecasts from their district agricultural office experts. About 44% of the farmers had forecasting knowledge. Signs (indicators) used to forecast the start and end of rain season and weather forecasts include moisturized wind from North to South (31.9%) which shows onset of short rainy season and sign of heavy rainfall in the coming season, unusual heat increment (11.1%) and lighting towards East (16.1%) indicating to rain within late afternoon. Others include when the sky becomes clean (0.5%), there will be rain within a week period. The sound of Eagle (0.5%) also shows the coming season will be rainy/Belg (Figure 1).(...) The communities have also drought forecasting knowledge. A few (20.9%) of respondents have indigenous drought forecasting knowledge. Identified local knowledge for drought forecast include: there is drought in every four years (2.3%), when there is dry fog (10.1%), North to South dry wind (12.3%) and the wind after some rainy days (0.5%) were indicators for a bad season in the rural communities (Figure 2). The study communities believe there is a drought in every four years. This result coincides with the focus group discussions, the key informant interviews, and the results of climate data analysis precipitation index (SPI).(...) Less than half (44%) of respondents have weather and seasonal forecasting knowledge and only 20.9% of respondents have traditional drought forecasting knowledge."
6	People's perception of climate change impacts and their adaptation practices in Khotokha valley, Wangdue, Bhutan	Suberi, B.; Tiwari, K.R.; Gurung, D.B.; Bajracharya, R.M.; Sitaula, B.K.	Indian Journal of Traditional Knowledge	2018		"The study revelead that 79% of the interview respondentes perceived na effect of climate change on their daily activities, while 14% were uncertain (Fig.2ª), although they could understand the concept of climate change and potential impacts. Most of the respondentes (44.4%) identified changes in forest composition, rainfall and temperature as taking place within recente years, while 37% cited changes including flowering time, rainfall patterns and temperature which is attibuted to climate change. However, 15% of respondentes had no clear idea about what changes were taking place. In total (85%) of the surveyed households indicated a perceived increase in average temperatures and decrease in rainfall amounts (Fig.2b).They also reported experiencing unpredictable rainfall patterns, especilly over the past 10 yrs.(...) All the respondentes expressed that the climatic changes they observed affect their farming activities. The main impact highlighted by local farmers was low crop production. The Fig. 5ª shows that low production was attriubted to lack of rain, presence of insect pest and unwanted weed invasion. (...) Local people reported that climatic conditions have affected their daily activities and their livelihoods. (...) Besides the changes indicated above, local people have also noticed immense changes in their surroundings within the last few years. These include loss of snow cover on mountains which used to be covered with snow throughout the year, but now are bare for much of the time."

26	Climate change adaptation in the western-Himalayas: Household level perspectives on impacts and barriers	Pandey, R.; Kumar, P.; Archie, K.M.; Gupta, A.K.; Joshi, P.K.; Valente, D.; Petrosillo, I.	Ecological Indicators	2018	10.1016/j.ecolind.2017.08.021	"Respondents in this study consider climate change as it relates to local and regional changes in weather patterns and conditions, and do not necessarily refer specifically to the broad concept of global and anthropogenic climate change. Although respondents may not necessarily understand the complex connections between human activity and climate change, their responses show that they are generally aware of the problem and they have at least a broad understanding of the causes and implications. The villagers are aware that changes in temperature and rainfall that are taking place in the region can be attributable to deforestation and vehicular pollution. Eighty nine percent of respondents agree that climate change is real and it is already happening now, with another 11% responding that climate change is probably happening but the impacts will be seen in the near future. In addition, 85% of respondents consider climate change to be either a serious or very serious problem, with the remaining 14% reporting that it is a somewhat serious problem. Surprisingly, the collective attitudes about the urgency of the climate change problem stand in stark contrast to the lack of severity assigned to the top challenges mentioned previously.(...) Five of the presented potential consequences: negative impacts on local wildlife, negative impacts on local forest ecosystems, increased local air temperatures, less frequent local rainfall and decreases in local water quantity or quality were considered by at least 90% of respondents to be at least moderately likely as a result of climate change (Fig. 4). The two potential positive impacts of climate change on wildlife and local forest have been selected by a very low percentage of respondents, therefore impacts from climate change are generally considered to be negative.(...) Eighty percent of respondents report recent shifts in precipitation patterns in terms of duration, frequency and timing. (...) Respondents collectively agree that winters have become drier and slightly more than half of respondents (59%) report that the volume of snowfall has decreased over the past 20–25 years. According to respondents, snowfalls that generally interest the area at least two or three times during the winter, are completely absent in some recent years, as well as it is evident the reduction of perennial snow. Eighty-five percent of respondents report increased average local temperatures and increased occurrence of extreme temperatures during the most recent years. Temperature changes have been experienced year-round and respondents report that winters are shorter and less severe than previously. (...) Respondents report that rising winter temperatures and changes in precipitation patterns have led to a decrease in water availability in the summer as streams dry up early in the season and are not consistently replenished by rainfall. Respondents from each of the involved villages report that changes in precipitation patterns and forest degradation have resulted in low groundwater recharge; which has reduced water levels in local springs. (...) According to 74% of respondents the productivity of agricultural land has been declining in recent years, and 60% believe that recent fluctuations in weather, including the unpredictability of precipitation, have had the major negative impacts on agriculture.(...) In addition to the impacts on agricultural land, residents report that forests have also been suffered under changing climatic conditions. Ninety eight percent of respondents believe that forests are among the most important natural resources in Uttarakhand as they are central to the agricultural economy. Residents of this region are dependent on forests for fuel wood, grass and other biomass. Because of recent changes in weather patterns, broad-leaved species, a highly nutritious source of fodder, are gradually disappearing from the forest. Because of changes in precipitation patterns, moisture availability is either insufficient or not timely to allow for proper germination. Respondents report that chir (pine) forests thrive in the drier soil, but forest fires, even in mixed forests, have become more frequent during recent times".
1	Merging Indigenous Knowledge Systems and Station Observations to Estimate the Uncertainty of Precipitation Change in Central Mongolia	Fassnacht, S.R.; Allegretti, A.M.; Venable, N.B.H.; Fernandez-Gimenez, M.E.; Tumenjargal, S.; Kappas, M.; Laituri, M.J.; Batbuyan, B.;	Hydrology	2018	10.3390/hydrology5030046	"All herders stated that they observed a decrease in rainfall, with all herders in the north and most herders in the south observing strong decreases (Figure 3). Most herders observed an increase in rainfall intensity with a few seeing a decrease, while others—5% in the north and 27% in the south—observed no change in rain intensity. Herder observations of snow were mixed, with more than 50% in both regions stating that they saw a decrease, but some saw an increase, while a number saw no change. Some saw fewer days with snow while a larger percentage saw more snow days—35% and 53%, in the north and south, respectively, saw no change (Figure 3)."
1	Wading past assumptions: Gender dimensions of climate change adaptation in coastal communities of the Philippines	Graziano, K.; Pollnac, R.; Christie, P.	Ocean & Coastal Management	2018	10.1016/j.ocecoaman.2018.01.029	"Men within the study sites were found to be significantly more likely than women to feel that both their assets and livelihoods or occupations are at risk to impacts associated with climate change and coastal resource degradation. In particular, men were significantly more likely than women to feel that their assets (house, property, etc.) are at risk due to coral bleaching and overfishing. Men were also significantly more likely than women to feel that their livelihoods or occupations are at risk to coral bleaching and overfishing. However, gender had no influence on whether individuals felt at risk due to flooding, coastal erosion, or ocean tides (Table 3). Interestingly, women and men were equally likely to report changes within the past five years in conditions of coral reefs (U: 4280, p=.22), mangroves (U: 5263.5, p=.369) and fisheries (U: 5633.5, p=.832). So, even though men felt at risk to overfishing, women were just as likely to report deteriorating conditions of fisheries and coral reefs. Individuals who identified as fisherfolk were significantly more likely to feel that their assets and livelihoods are at risk to coral bleaching, overfishing and ocean tides. For both livelihoods and assets, identifying as fisherfolk had no significant influence on perceptions of risk to both erosion and flooding (Table 4). (...) Men were significantly less likely to be aware of climate change (56.5% men, 63.7% women; Chi Square: 4.75, df=1, p=.03, n=917). Although the women in our sample did not feel significantly more connected to nature or environmentally conscious, our results demonstrated that women are more likely than men to report changes in certain weather patterns within the last 30 years. In particular, women are statistically significantly more likely to note changes in temperature patterns and rainfall patterns (Table 6). Although men were less likely to be aware of climate change, men (14.7%) are statistically significantly more likely than women (9.3%) to have participated in public awareness activities related to the ocean and climate change (Chi square: 6.027, df=1, p=.014, n=913). However, when the sites were split into CTSP project and control sites, this difference was only true for control sites (Chi Square: 6.081, df=1, p=.014, n=320), where 9.2% of women attended compared to 19.9% of men. In CTSP project sites, a smaller proportion of men attended public awareness activities (11.4% of men compared to 9.3% of women), such that there was no significant difference between genders (Chi Square: .663, df=1, p=.415, p=593). Furthermore, in all sites, there is no gender difference in participation in Climate Change trainings (5.6% of men, 6.1% of women, Chi Square: .110, df=1, p=.740, n=917), in contrast to the public awareness activities discussed above."
1	Individual Local Farmers' Perceptions of Environmental Change in Tanzania	Roschel, L.; Graef, F.; Dietrich, O.; Schafer, M.P.; Haase, D.	Water	2018	10.3390/w10040525	"The results of the statistical analysis shows that perceptions of change related to climate (Table 1) and environment (Table 2) were significantly different between the two regions. While 97% of all farmers from both regions perceived climatic changes over the past 20 years, highly significant differences in perceptions became apparent for changes in temperature, forest, grazing lands, soil fertility, river water levels, food security and coping activities. The perception of interviewees from Dodoma in regards to changes in temperature revealed that individuals felt less affected by potential changes than interviewees from Morogoro. Individuals from Dodoma more often expressed that they had not perceived any change in temperature as well as lower temperatures during the summer season. Interviewees from Morogoro reported to have suffered more heat days and extreme temperatures than those from Dodoma."
1	Variation in perception of environmental change in nine Solomon Islands communities: implications for securing fairness in community-based adaptation	Ensor, J.E.; Abernethy, K.E.; Hoddy, E.T.; Aswani, S.; Albert, S.; Vaccaro, I.; Benedict, J.J.; Beare, D.J.	Regional Environmental Change	2018	10.1007/s10113-017-1242-1	"As Fig. 2 illustrates, males were more likely to have perceived change than females, who were much more likely to offer a no change response. Distance to market town had a substantial influence on choice, and, as the dis tance from the market increased for each village, both men and women were more likely to report having seen a change. The largest change reported by men was that there were “less fish or that fishing was more difficult”. The probability of men saying that they had seen this change increased the further away from market they lived. The other important change that men reported having seen was that “currents were getting stronger”. The probability that men reported this also in creased with distance to market town. In the outer reef system model, only gender was statistical ly significant (see ESM Appendix 4, Fig. 4 and Appendix 5 Table 6). Women were more likely to say that there had been no change than men. Men considered “habitat damage” to be the next most important change, followed by “less fishing/ fishing more difficult” while these two observed changes were reversed among the female respondents. In the lagoon system, only years of education and distance to market were statistically significant (ESM Appendix 5 Table 7), age and gender having little discernible effect. Greater distances to market towns made people more likely to say there had been no change in the lagoon. The interviewees were also more likely to say that there had been no change if they had had less education. More varied reasons were cited for change in the lagoon than in the other systems examined. The two main reasons for change examined in this system (“dirtier/more turbid water” and “less fish/fishing was more difficult”) were both relatively rarely cited (~ 10%), and the probabilities that these would be chosen diminished with distance to market. (....)For the weather system, the only statistically significant predictor was distance to market (ESM Appendix 5 Table 10): age, gender, employment and educational level all made no difference. The most likely changes in weather that people reported were that there was “more rain” and that “seasons had become more unpredictable”. People who lived further away from the market town were much more likely to say that there was more rain nowadays and less likely to say that “seasons were more unpredictable”."

1	Climate Change Awareness and Adaptations Among the Farming and Animal Rearing Communities of the Central Sokoto Close-Settle Zone, North-Western Nigeria	Jibrillah, A.M.; Jaafar, M.; Choy, L.K.	Jurnal Kejurutera an	2018	10.17576/jkukm-2018-si1(6)-09	"Figure 6 revealed that, 78% of the respondents are aware and have noticed the changing nature of the climate in the area over the years. These are mostly people who are above 40 years of age as they live long enough to witness significant changes in the climate of the area mostly as it affects temperature and rainfall patterns; increasing aridity and land degradations; increasing frequency and intensity of extreme events such as drought, flooding and violent windstorms; shrinking and drying of water sources such as rivers, streams, pond and lakes as well as declining vegetation cover in the area. Another 13% of the respondents who are mostly young people below the age of 30 years claimed to have witnessed little or no significant changes in the climate of the area, while 9% remained indifferent as to whether the climate of the area has witnessed any change or not. (...) Although, all the respondents were unanimous on the occurrence of most of the above manifestations, there were however, divergence of opinions as to which amongst them is the most spectacular and most challenging manifestation of climate change in the area. 28% of the respondents considers declining rainfall as the most spectacular and challenging signs of climate change in the area. This also includes other uncertainties associated with it such as late onset and early cessation of the rainfall. Another 26% of the respondents regarded increase in the temperature of the area as the most spectacular and challenging manifestation of climate change. (...) Other manifestations of climate change in the area are the occurrences of frequent extreme climate events such as drought and flooding regarded as the most serious among them by 19% of the respondents, decreasing vegetation cover voted for by 14% of the respondents and supported by the findings of Eniolorunda and Bello (2011) and Jibrillah et al. (2016), although many human activities could also affect the vegetation cover. Lastly, 13% of the respondent reported drying/shrinking of water bodies such as rivers, streams and ponds as the most challenging symptoms of climate change in the area. (...) People in the study area exhibit different perceptions on the causes of climate change. Although they were unanimous on the multiple causes of climate change, they however, differ in their ranking of these causes based on their degree of influence in changing the climate of the area. Figure 7 above, depicts this divergence of opinions. 39% of the respondents regarded climate change as something naturally caused by God. These are mostly aged people with strong religious conviction and believe that, everything is predestined by God. 7% attributed it to industrial activities due to the release of exhaust smokes from the industries and factories into the atmosphere, thereby causing greenhouse effects. In the same way, 15% of the respondents attributed it to the burning of fossil fuels by the automobiles particularly, with increasing number of automobiles in the area in recent decades. 14% to deforestation, caused mainly by rapid population growth and urban expansions. 13% attributed climate change mainly to the burning of fuel woods and exhaust from electric generators at homes and offices, while 12% attributed it to bush burning."
1	Historically evolved practices of the Himalayan transhumant pastoralists and their implications for climate change adaptation	Aryal, S.; Panthi, J.; Dhakal, Y.R.; Gaire, N.P.; Karki, K.; Joshi, N.R.	International Journal of Global Warming	2018	10.1504/IJGW.2018.090402	"Majority of transhumant herders have perceived changes in temperature, rainfall and snowfall. Most of the respondents (81.5%) mentioned that the summer temperature is increasing (Table 2). This coupled with the observed increasing trend for summer season (Figure 2). However, the perceived decreasing temperature in the winter season did not correspond to the trend shown by observed data (Table 2). Respondents who perceived change in rainfall mentioned that rainfalls (annual. monsoon and winter) were increasing. These perceptions of herders were consistent with the observed trends (Figure 3, Table 2). In addition to temperature and rainfall, transhumant herders have perceived that amount of snowfall has heavily declined in recent years (Table 2)."
10	Comparing perceived effects of climate-related environmental change and adaptation strategies for the Pacific small island states of Tuvalu, Samoa, and Tonga	Beyerl, K.; Mieg, H.A.; Weber, E.	Island Studies Journal	2018	10.24043/isj.53	"The analysis of the qualitative and quantitative data shows that the kind of climate-related environmental changes that affect the respondents' lives most, as well as the assessment of the severity of this affectedness vary between and within the three countries (Figure 3 and Table 2).(...) The majority of the Tuvaluan participants named drought when they were asked what environmental change affects their daily life most. The lack of rainfall and limited water storage capacity led to scarcity of drinking water on the coral atoll, in particular in the year of the survey. Although the respondents also described effects of storms, flooding, erosion, and high temperatures, the main focus of the answers to the open question was on drought-related problems. These statements are also supported by the quantitative data. Samoan participants emphasized impacts of drought, lack of drinking water, and water pollution on plants and human health when asked about environmental changes that affect their lives most. Also, high temperatures and flooding caused by rainwater and seawater were often mentioned as pressing issues. Compared to the Tuvaluan and Tongan samples, the rather young Samoan participants mentioned financial impacts of environmental effects in their replies to the open question more often than damages of houses. Tongan respondents described a multitude of environmental changes that severely affect houses, plantations, and human health. These include cyclones, heavy rainfall, flooding with rainwater and seawater, soil erosion, lack of drinking water, as well as high temperatures. Combined with material damage and health impacts, financial burdens were highlighted. The quantitative rating shows, for instance, that the majority of the Tongan participants has been affected severely by cyclones (56.7%) and erosion (51.7%). For the future, the participants from all three countries expect to be affected even more severely by the impacts of environmental change."
3	Smallholder farmers' perception of climatic and socio-economic factors influencing livelihoods in the transition zone of Ghana	Derkyi, M.; Adiku, S. G.; Nelson, V.; Delali Dovie, B.; Codjoe, S.; Awuah, E.	AAS Open Research	2018	10.12688/aasopenres.12839.1	"The low formal education observed among the women could be seen as a general trend for females in the district compared to the males (GSS, 2012). The variation in education was not seen as a hindrance to the effects of climate change on the gender category. Both men and women farmers felt and experience the effects of changes in rainfall pattern, high temperature as well as long drought on their farming systems. However, regarding knowledge and education on climate change and best farming practices, Amponsakrom No. 2 inhabitants during the community meeting revealed that their first awareness of climate change had been as a result of discussions with the Climate Impact Research Capacity and Leadership Enhancement (CIRCLE).(...) 158 of the respondents made up of 26 males and 32 females indicated that they have noticed differences in temperature over the past 10–20 years. Of these, 65% males and 66% females said the changes in temperature were high whilst 35% males and 34% females reported of extremely high temperatures, observed especially in the 2015 planting season (Table 3).(...) With respect to changes in rainfall pattern over the past 10–20 years, 36 respondents answered this question represented by 17 males and 19 females. Generally, all the respondents indicated less, erratic, delayed onset and unpredicted timing of rainfall as the observed changes and attributed them to deforestation, past wildfire incidences and prolonged drought."
3	Effect of climate change in paddy production and adaptation strategies in Tharu communities of Dang district, Nepal.	Poudel, P. R.; Joshi, N. R.; Pokhrel, S.	Journal of Agriculture and Natural Resources	2018	10.3126/janr.v1i1.22223	"Out of the 120 respondents, 83.3 percent were aware about climate change. Among them, only 32.50 percent of farmers heard climate change frequently while 50.83 percent heard occasionally. Major source of information about climate change was neighbor/friends (47 percent), followed by mass media (45 percent) and teachers/trainer (8 percent). (...) From the perception of farmer's, it is found that summer temperature was most changing parameters which gain the highest index score and followed by rainfall timing. Similarly rainfall timing, annual temperature, rainfall intensity, rainfall pattern, winter pattern are found to be changing and ranked. Among the asked parameters hailstorm events perceived as the least changing parameter shown in Table 8. Change in weather parameters is important factor that determine the farmers' perception about climate change. Respondent were asked whether they had experienced any deviation in the weather parameters like rainfall, temperature, drought, hot waves, and cold waves. Majority of the respondents had experienced the change in the climatic parameters shown in Table 8.Respondent of study area perceived that climatic parameters were changed hazardously. Among 120 respondent 91 respondents gave positive response towards the changing rainfall pattern, 100 respondents gave positive response to timing of rainfall changed, 82 respondents perceived positively to the rainfall amount changed and 101 respondent perceived that intensity of rainfall is changing. Table 9 revealed that that 84.17 percent of farmers perceived summer temperature was increasing and 56.67 percent perceived winter temperature was decreasing. Similarly most of the farmers (79.17 percent) perceived frequency of rainfall was decreasing while 49.17 percent farmers perceived intensity of rainfall was decreasing and 40.83 percent farmer perceived intensity of rainfall was increasing. Respondent of study area perceived that climatic parameters like temperature, hot waves, cold waves, drought, hailstorm, lightening were changed hazardously."
3	Perception analysis of climate change and adaptations by smallholder farmers in Nepal	Ghimire, N. P.; Aryal, M.; Regmi, P. P.; Thapa, R. B.; Pande, K. R.;	Journal of Agriculture and Environme	2018	10.3126/aej.v17i0.19866	"Figure 1 and 2 present farmers' perception about temperature change and precipitation in Rupandehi district in 2014. Majority of the respondents (46%) expressed that they perceived the increased temperature in 2014. Majority of the respondents (30%) perceived the decreased rainfall and 33% perceived the change in timing of rains in Rupandehi district (Figure 2).(...) The events of higher temperature, faster water evaporation, increased incidence of pests and weeds, violent rainfall and hailstorms, delayed rainfall and less clearly defined seasons were responded by 89, 72, 71 68 65 and 65 % of respondents on the issues of environment change for farming."
3	Climate Change Perception Among the Pastoralist Women in Narok County	Mashara, J. N.	Academic Research International	2018		"Overall, the interviews suggest that women are aware of climate change and that in one way or another, the effects of climate change in all the county have been felt socially and economically.(...) With regards to knowledge on climate change, approximately 78 % of the respondents interviewed acknowledged their awareness of climate change through forums organized by the county governments, Non-Governmental organizations and Faith Based Organizations. Most descriptions given were cited form the changes that occur in their environments as well as those that affect their livelihoods. Some of the common definitions include: disappearance of certain bird species, shortage of rainfall, shrinking of rivers, drying up of some springs, extinction of certain plant species some with medicinal value and unprecedented changes in temperatures during day and night. Other respondents could not correctly describe the concept of climate change as some related it with aspects such as lightning and earthquake. Others associated it with some form of punishment or curse from God for not obeying him, while others described climate change in relation to how it is manifested in their livelihoods. The table 5.1.1 below illustrates some of the excerpts taken from the FGD notes with regards to the respondents' perception to climate change. "

3	Socio-economic Impacts of Climate Change on Smallholder Livelihoods in Shashogo District, Hadiya Zone, South Ethiopia	Ludago, S. C.	Journal of Environment and Earth Science	2018		"Accordingly majority of smallhold farmers (87.04%) perceived that temperature of the study area was increased and about (4.94%) perceived that the temperature of the study Area was unpredictable. However 5.5% and 2.5% of the respondents indicate on no temperature related climate change, but there were increase and unpredictable nature of temperature of an area.(...) In addition to temperature change of an area, (81%) of households responded on decreasing nature of rainfall and (6.8%) and (4.2%) of responded on increasing and unpredictable change of rainfall conditions respectively. However 5%, 1.2% and 1.8% of respondents reported on decreasing, increasing and unpredictable but no climate change in the district respectively.(...) Farmer's perception on temperature increase and rainfall decrease was also supported by focus group discussion and key informant interview. As a result of that the FGD and KI interview participants responded that the temperature is increasing and rainfall amount is decreasing and its timing was highly unpredictable.(...) Smallholders Perception shows that 71% and 82.1% of households perceived that there were climate induced drought and flood impacts in Shashogo district respectively.(...) Almost all of the respondents had lived in the area for a long period and had an insightful knowledge about the past and current climatic conditions of an area. Accordingly temperature increase (92.5%), shortening of cropping period (80.1%), rainfall unpredictability (73.3%) and highly erratic nature of rainfall (72.6%) were reported and ranked as the most important local climate change indicators in Shashogo district. Furthermore, occurrence and frequency of drought and flood (50.6%) and (58.9%) respectively were also another important climate change indicators in the study area (Figure 4). It was generally recognized that local climate change indicators considerably indicates that the climate of Shashogo district was unpredictable. Accordingly, households had clear awareness about climate change in the study area. Household survey results, focus group discussion and key informant interview inseparably confirmed that climatic conditions of the Shashogo district were unpredictable.(...) Furthermore key informant interview and focus group discussers noted that, earlier trends of rainfall had been altered and the current trends also stayed mostly unpredictable.(...) Regarding the impacts of climate change 87.7% and 74.1 % of the respondents indicated that drought and flood respectively were the main climate change impacts severely threatening smallholds livelihood strategy in Shashogo district. In addition, food shortage and emergence of crop disease 43.2% and 28.4% respectively were reported as climate induced impacts in the study area (Figure 8)."
3	Knowledge and perception of climate change among peasant farmers in a forest-savannah transition zone of Odo-Otin Area of Osun State	Samuel, K. J.; Adeniyi, S. A.; Adetunji, K.	African Journal of Sustainable Development	2018		"Table 3 shows that a greater proportion of the farmers (76%) claimed they were aware of the climate change phenomenon while 24% were not aware. (...) Electronic media (74%) and print media (24%) were the two sources from which farmers got information about climate change. Curiously, none of the farmers claimed to have had about climate change from professional services (extension service inclusive) despite the importance that has been attributed to it in the literature as a veritable source of climate change awareness (Madison, 2006; Gbetubouo, 2009).(...) On what they perceived was responsible for decrease in yields which many of them reported, more than half of the respondents (51.8%) attributed this to climate change.Other reasons citedfor decrease in yield included inadequate farm input (19%), land use practices (13%).(...) Majority of respondents (62%) identified rainfall as the climatic element that has changed over time while another 32.4% indicated that temperature had changed considerably. (...) It was further revealed that respondents perceived the effect of climate change to manifest in the form of flooding (42.5%), drought (24.8%), soil erosion (22.3%), rapid growth of weeds (7%), leaching (2%) and disease spread (1.4%). These facts are indications that the peasant farmers had been observing sustained variabilities in the rainfall and temperature patterns over the years, though may not have understood this in the context that climate change is currently conceptualised."
3	Farmers' Perceptions of Climate Change and Its Effects on Tree Cover in the Drylands of South Eastern Kenya: The Case of Matungulu Sub-County, Machakos County	Mutuku, H. M.; Kungu, J. B.; Mburu, B. K.	Journal of Natural Sciences Research	2018		"For example, farmers rated the occurrence of seasons without enough rainfall as generally high (4.0) implying that seasons without enough rainfall occurred frequently in Matungulu Sub-County. Rainfall amount (4.4) and early commencement of rainfall (4.3) were highly rated, while the occurrence of flooding (3.9) was tending to high frequency in the study area. Drought occurrence was rated high in Koma Location (4.1), compared to Sengani Location (2.2). The occurrence of long inter-seasonal dry spells were also rated high in both locations compared to three decades ago (Table 3.1). The results show that the climate was characterized by 3 main components which explained 57% of the total variance in perception of climate parameters by farmers. The first component describing farmer perception of the climate 3 decades ago was described by high temperature and dry-spells, coupled with low and late commencement of rainfall. The second component comprised of descriptions of flooding and drought, while the last component was a description of early commencement of rainfall. Figure 3.1 below describes the changes in climate patterns according to farmer perception in Matungulu Sub-County, over a decadal time sequence as follows; 10 years ago, 20 years ago and 30 years ago. In regard to increased number of seasons without rainfall, 42% of the respondents said that this had happened 10 years ago, 17% said 20 years ago while 20% indicated 30 years ago. This implied that there was a general perception of increased seasons without rainfall in Matungulu Su-County. Rainfall had decreased in Matungulu Sub-County according to 37% of the farmers (10 years ago), 42% of the farmers (20 years ago) and 36% of the farmers (30 years ago). These results regarding rainfall decrease depict a declining rainfall trend over the three decade period according to farmer perceptions. In regard to late rainfall commencement, farmers recorded an increasing trend in the following order: 8% said in the last 10 years, 37% said in the last 20 years, and 40% said in the last 30 years. The proportion of those who believed in the occurrence of late rainfall commencement reduced considerably over the last 10 years. Nonetheless, this means according to farmers' perceptions, there was increase in late commencement of rainfall in Matungulu Sub-County over the last three decades. 60% of the farmers reported occurrence of shorter periods of rains 10 years ago, 45% 20 years ago, and 23% 30 years ago, respectively. This means farmers generally had perceived accelerated shortening of the rainy period in Matungulu Sub-County over the last two decades.(...) bout 38% of the farmers reported higher temperatures 10 years ago, 37% reported higher temperatures 20 years ago and 16% reported higher temperatures 30 years ago in Matungulu Sub-County. This means a higher proportion of farmers perceived occurrence of higher temperatures in their region with each passing decade. In both study sites, there was perception of declining low temperatures, with time, implying that low temperatures had declined with time, changing from 30% (10 years ago), 27% (20 years ago), and 15% (30 years ago) in Matungulu Sub County. This is a manifestation that low or minimum temperatures had risen with time in the study area. In regards to interseasonal dry spells, these had increased as reported by 37% (10 years), 33% (20 years) and 15% (30 years ago) farmers in Matungulu Sub-County. The perceptions of drought were mostly from increasing events in the study area (16%, 30%, and 38%) over the 10, 20, and 30 year periods, respectively.(....) Most of the farmers demonstrated that they had experienced some form of temporal historical change in temperature and rainfall characteristics. Farmers in the study area indicated that they experienced an increase in seasons without enough rainfall, while total rainfall amounts had decreased with time. The lateness in rainfall commencement dates had increased in frequency while emperature trends portrayed a pattern of increasing temperature with time. The frequency of inter-seasonal dry spells was also reported to have increased over three decades by the farmers in the Sub-County.(...) Overall, most (84%) of the respondents thought climate change had impacted tree cover in the study area (Figure 3.5). These farmers went ahead to explain how tree species composition and density had changed in the locality over the same period, attributing it to climate change."

3	Do Smallholder Farmers Perceive Rainfall Variability the Same and Correctly? Gendered and Spatial Analysis of Perception Versus Actual Trends of Rainfall in Three Livelihood Zones in Kenya	Kiumbuku, S. K.; Baaru, M. W.; Mutinda, J. W.	Journal of Environment and Earth Science	2018		"When asked whether they had experienced any variations in rainfall trends in recent years, majority of respondents (97.9%) had the perception that rainfall had generally varied with time (Table 4). This comprised of 98.1% male respondents and 97.6 female respondents. There was no significant difference in responses between men and women ($\chi 2$=0.114, p=0.736) (Table 4). The respondents were asked whether they had noted any variations of rainfall in the past ten years in terms of duration and amounts. Majority of them (97.9%) responded that they had actually noted some changes in rainfall pattern. This comprised 98.1% and 97.6% of male and female respondents respectively who reported past changes in rainfall patterns and increased occurrences of droughts Variability of rainfall was perceived by respondents in relation to onset and offset of rains, the duration of rainy season or cessation as well as amounts of rainfall (Table 4). They felt that rainfall had varied in the following ways; onset are getting late (63.3% male respondents and 67.0% female respondents); offset are coming early (48.1% male respondents and 42.9% female respondents), rains have become less (61.4% male respondents and 61.0% female respondents), length of the rainy seasons have decreased (83.3% male respondents and 88.6% female respondents) and that rainfall has become erratic and unpredictable (80.0% male respondents and 86.2 female respondents) (Table 4).(...) Rainfall variability was also perceived in terms of its impacts on livelihoods, specifically crop performance, animal health, pasture availability, crop health and productivity and water availability. Qualitative information from focus discussion groups sowed that there was a general perception that in the last 5-10 years rains have been setting on late than it used before. Most respondents indicated that long rains season used to begin around 15th of March while short rains season began around 15th October of each year. According to respondents the situation had changed since rains are starting later than these dates. Respondents attributed a lot of agricultural failures to unpredictable rains.(...) Participants in an FGD also indicated that rainfall patterns are hard to predict in the last fifteen years. They explained in agreement that due to scarcity of rains both in amounts and duration, they were affected by repeated crop failures associated with stunting and drying of crops before maturity. They also incurred losses when rains delayed upon sowing their seeds in anticipation of rain. The seeds were reported to either be destroyed by rodents, excess heat and rotting. This situation forced them to replant when the rains set in.(...) Rainfall variation was perceived differently by the respondents in the three sub-counties (see table 5). This was attributed to wide variety of experiences of historic events and livelihood system in the three sub-counties. Respondents from Mbooni sub-county perceived the variations more compared to respondents from Makueni and Kibwezi East sub-counties (Table 5) despite the fact that from meteorological analysis Kibwezi East had the highest variation. Respondents from Makueni sub-county perceived late onset of rainfall (ß=-0.934, p=0.001), early offset (ß=-1.456, p=0.001) and unpredictability of rains (ß=-0.982, p=0.002) more significantly than in Kibwezi East sub-county. However, less rainfall (ß=1.154, p=0.001) and shortened rains (ß=1.133, p=0.001) were perceived more in Kibwezi East sub-county compared to Makueni sub-county (Table 5).(...) From the results majority of respondents (62.2%), both male and female, perceived that the rainfall had reduced with time.(...) The situation was perceived similarly by significant number respondents (83.1%) who reported that the rains had become erratic. Unreliability of rainfall was also reported to be caused by late onset (reported by 62.5% of respondents) and early offset (reported by 45.5% of respondents) (Table 6)."
1	Has the Environment Changed - What Can Be Done to Help the Fishermen Community? The Views of the Small Scale Fishermen in Malaysia	Idris, K.; Muhammad, M.; Abu Samah, A.; Suandi, T.; Shaffril, H.A.M.	Pertanika Journal Of Social Science And Humanities	2018		"Several themes emerged during discussion, namely awareness of the changes, temperature rise, difficulty in predicting the climate, extinction of mangrove swamps, eroded coastal areas, unstable rain pattern and decreasing marine resources. Most of the participants were aware of the environmental changes in their areas (...). This was acknowledged by NBP2, who stated, “There are lots of differences (regarding the climate nowadays).” This was supported by NBP 1, who claimed that the season nowadays was no longer the same as before: “The season nowadays is not similar to the past.”(...) The participants stated that rising temperature was among the obvious changes to the climate in their areas.(...) NTP 1 confirmed this, saying, “It is very hot nowadays.” NT6 also supported the researchers’ findings with this insight: “In my early days as [a] fisherm[a]n, the temperature [was] less hot than this day.”(...) The participants also confirmed that it was difficult to predict the climate nowadays. (...) Indeed, according to one of the participants, “We cannot predict (the climate), the climate nowadays is too difficult to predict” (NBP 1). NP 2 said that it was difficult to predict the climate nowadays and stressed the instability of the wind, adding, “The wind nowadays is unpredictable. In the previous days it is easier to predict on what type of wind that you are expecting to face at the sea.”(...) The extinction of mangrove swamps is another change mentioned by the participants.(...) Most of the participants explained that some coastal areas where they lived were eroded.(...) Unstable rain pattern is another phenomenon of changing climate highlighted by the participants.(...) One of the participants said, “The rainfall has decreased, in the previous days, before going out to the sea, due to frequent rain, I need to take out all of the water inside the boat almost every day, but not anymore in this day.” Another participant shared that it sometimes rained for a week, stating, “It (the rain) can be up to three days, and sometimes even up to a week.” (NT1). (...) According to the participants, marine resources, especially fish, are reduced.(...) With agreement among the participants that there were visible signs of weather change such as temperature rise, difficulty in predicting the weather, extinction of mangrove swamps, an eroded coastline, unstable rain pattern and decreasing marine resources, the discussion then moved on to their views on the causes of these changes. Two themes emerged, namely the human factor and the natural factor.(...) In addition to human factors, the participants also referred to natural factors such as climate change."

APÊNDICES – CAPÍTULO II

Apêndice A – Calendário sazonal.

CALENDÁRIO SAZONAL KISEDJÊ		JAN	FEV	MAR	ABR	MAI	JUN	JUL	AGO	SET	OUT	NOV	DEZ
AGRICULTURA	Preparo do terreno (roçada)												
	Derrubada												
	Queima												
	Limpeza da roça												
	Plantação												
	Colheita												
ANIMAL	Caça												
	Pesca com timbó												
	Pesca												
	Api (Hwsykrãtxi)												
COLETA	Bacaba (Kambêrê sy)												
	Buriti (Ngrwa)												
	Inajá (Riki)												
	Ingá (Kõgnhõtõtxi)												
	Jatobá (Mbõro)												
	Macaúba (Õtõ)												
	Mangaba (Pêni)												
	Maracujá do campo (Mekarõtõ)												
	Murici (Kutẽsy)												
	Murici do mato (Kutẽtxisy)												
	Tucum (Ronsy)												
	Oiti (Mbonhõ)												
	Pequi (Hwĩni)												
	Urucum (Hwy)												
	Akhrõtxitõ (fruta vermelha do cipó)												
	Hwĩsynteke (fruta amarela do mato)												
	Hwĩsõksy (fruta preta no rio)												
	Hwĩsõktxisy												
	Hwĩsykajkiri												
	Hwĩsykanbrẽktxi												
	Hwĩsynhõkẽntu												
	Kõgnhõtõ tekátygy (inajá menor)												
	Kõpnhĩsy (tucunzinho)												
	Kutumgre (cipó com fruta)												
	Ntomsy												
	Ngrwará (buritirana)												
	Rẽk rato												
	Sakrotxi												
	Metyksy												
	Hwĩkrosy												
	Krõgnhõtõsĩ (ingázinho)												
	Ronkrãsĩtygy												
	Khinini												
	Hwĩsytygy												
	Hwĩsẽsy												
	Kutẽkrãkry												
	Ronkrãsĩká nhi txira												
FESTAS		Festas Amtõ e Akatxi	Festa Akatxi	Festa Akatxi	Festa Akatxi	Festa Kahãnkasáto	Festa Kahãnkasáto	Festa Kahãnkasáto	Festa Kahãnkasáto	Festa Akatxi	Festa Akatxi	Festa Akatxi	Festas Amtõ e Akatxi
CLIMA	Nível do rio												
	Chuva												
	Temperatura												
		JAN	FEV	MAR	ABR	MAI	JUN	JUL	AGO	SET	OUT	NOV	DEZ

LEGENDA	
●	Mulheres
●	Homens
●	Crianças
	Baixa intensidade
	Média intensidade
	Alta intensidade

Apêndice B - Protocolo das entrevistas estruturadas.

Universidade de São Paulo *Projeto: Mudanças climáticas*	***Dia da semana:*** _____ *Cód:* |__| ***Data da entrevista:*** ____/____/2019 ***Entrevistador:*** _____ *Cód:* |__| ***Número da entrevista:*** |__|__|__|
Entrevista com <u>indivíduos</u> adultos (>=18 anos)	***Comunidade:*** _____ ***Número da UD:*** |__|__| ***Clima no dia da entrevista:***

Nota: Os trechos em itálico são instruções ao entrevistador e não devem ser lidas ao entrevistado.

I – INFORMAÇÕES GERAIS SOBRE O INDIVÍDUO

Para começar vou perguntar sobre sua ida para a cidade, sobre as comidas do mato, da roça e sobre dinheiro.

1.1. Qual é o seu nome? _____ **1.2.** Sexo: |__| Feminino |__| Masculino (entrevistador completar)

1.3. Neste ano de 2019, quantas vezes você foi para a cidade? _____ *(anotar nº de vezes: 0,1,2,...).*

1.4. E no ano passado, em 2018, quantas vezes você foi pra cidade? _____ *(anotar nº de vezes: 0,1,2,...).*

1.5. Você já morou na cidade? |__| Não |__| Sim *(Se Não → ir para questão 1.7.)*

1.6. Por quanto tempo você morou na cidade? _____ *(Por exemplo, 1 ano, 8 meses, etc.)*

1.7. Você frequentou a escola na aldeia ou na cidade em algum momento da sua vida? |__| Não |__| Sim *(Se Não → ir para questão 1.9.)*

1.8. Por quanto tempo você estudou? _____ *(Por exemplo, 1 ano, 8 meses, etc.)*

Agora quero você pense no que comeu na última semana, ou seja, de ____ *(falar dia da semana hoje)* passada ao dia de hoje, pode ser a comida que veio da cidade, da roça, da mata, ou do rio.

1.9. O que você comeu nessa última semana?	**1.10.** Quantos dias na semana que você comeu _____ *(falar o item dito na pergunta anterior)? (Por exemplo, 5 dias).*	**1.11.** De onde veio essa comida? *(1=produção própria (roça); 2=da mata (coleta, caça), do rio (pesca); 3=presente (alguém da comunidade ou outra comunidade); 4=comprado (mercado/cidade); 5=comprado (comunidade)).*
1.9.1. _____	**1.10.1.** _____	**1.11.1.** _____
1.9.2. _____	**1.10.2.** _____	**1.11.2.** _____
1.9.3. _____	**1.10.3.** _____	**1.11.3.** _____

1.12. Você diria que nessa última semana, você (*Marque apenas uma opção)*: |__| Comeu todos os dias comida tradicional |__| Comeu mais comida da cidade do que a comida tradicional |__| Comeu todos os dias comida da cidade |__| Comeu de maneira igual a comida tradicional e a comida da cidade |__| Comeu mais comida tradicional do que comida da cidade.

1.13. Você vai na mata pegar algum produto, por exemplo, fruta, semente, lenha, mel, recursos para artesanato ou outra coisa toda semana? |__| Não |__| Sim

1.14. Quantas vezes você vai pegar algum produto da mata em um mês? _____ *(anotar nº de vezes: 0,1,2,...).*

1.15. Você pegou algum produto da mata no mês passado, ou seja, do dia ___ ao dia de hoje? |__| Não |__| Sim *(Se Não → ir para questão 1.18.)*

1.16. Que produtos você pegou na mata no mês passado, como frutas, remédios, lenha, mel, recursos para artesanato?	**1.17.** Qual foi a quantidade? (Por exemplo, 1 bacia, 1 carrinho de mão).
1.16.1. _____	**1.17.1.** _____
1.16.2. _____	**1.17.2.** _____

1.18. Você vai na roça pegar comida toda semana? |__| Não |__| Sim

1.19. Quantas vezes você vai pegar comida na roça em um mês? _____*(anotar nº de vezes: 0,1,2,...).*

1.20. Você trouxe algum produto da roça no mês passado, ou seja, do dia ___ ao dia de hoje? |__| Não |__| Sim *(Se Não → ir para questão 1.23.)*

1.21. Que produtos você trouxe da roça no mês passado? *(Para lembrar: abóbora, batata doce, mandioca, cará, banana, goiaba, milho, melancia, pequi, mamão, algodão, urucum, amendoim).*	**1.22.** Qual foi a quantidade? (Por exemplo, 1 bacia, 1 carrinho de mão).
1.21.1. _____	**1.22.1.** _____
1.21.2. _____	**1.22.2.** _____

1.23. Você pesca? |__| Não |__| Sim *(Se Não → ir para questão 1.29.)*

1.24. Você pesca toda semana? |__| Não |__| Sim

1.25. Quantas vezes você pesca em um mês? _____*(anotar nº de vezes: 0,1,2,...).*

1.26. Você pescou no mês passado, ou seja, do dia ___ ao dia de hoje? |__| Não |__| Sim *(Se Não → ir para questão 1.29.)*

1.27. Quais peixes você pescou no mês passado? *(Para lembrar: curimbatá; piaba; tucunaré; matrinxã; piranha vermelha ou preta; peixe cachorra; trairão; arraia; pirarara; corvina; jaú; pintado/surubim; tambaqui; cará; piau; bicuda; pacú; peixe-sabão; jaraqui; mandi; fidalgo; traíra; jacunda).*	**1.28.** Qual foi a quantidade? (Por exemplo, nº, 1 bacia, 1 carrinho de mão).
1.27.1. _____	**1.28.1.** _____
1.27.2. _____	**1.28.2.** _____

1.29. Você caça? |__| Não |__| Sim *(Se Não → ir para questão 1.35.)*

1.30. Você caça toda semana? |__| Não |__| Sim

1.31. Quantas vezes você caça em um mês? _____*(anotar nº de vezes: 0,1,2,...).*

1.32. Você caçou no mês passado, ou seja, do dia ___ ao dia de hoje? |__| Não |__| Sim *(Se Não → ir para questão 1.35.)*

1.33. Quais animais você conseguiu matar no mês passado? *(Para lembrar: 1=cateto/caititu; anta; paca; cotia; tracajá; tamanduá; quati; queixada/porcão; capivara; jabuti; mutum; macuco; tatu; jaó; jacamim; jacaré; veado; pombo; papagaio; arara; tucano; onça; jacu; macaco; inhambu; jacutinga).*	**1.34.** Qual foi a quantidade? (Por exemplo, nº, 1 bacia, 1 carrinho de mão).
1.33.1. _____	**1.34.1.** _____
1.33.2. _____	**1.34.2.** _____

1.35. Nos últimos 30 dias, você ganhou algum dinheiro? |__| Não |__| Sim *(Se **NÃO** → pular para questão 1.38.)*

1.36. *SE SIM:* De onde você ganhou este dinheiro?		**1.37.** Quanto foi que você recebeu (em reais)?
1.36.1. Aposentadoria	|__| Não |__| Sim	**1.37.1.** R$ _____
1.36.2. Auxílio-doença	|__| Não |__| Sim	**1.37.2.** R$ _____
1.36.3. Programa Bolsa Família	|__| Não |__| Sim	**1.37.3.** R$ _____
1.36.4. Pensão por morte	|__| Não |__| Sim	**1.37.4.** R$ _____
1.36.5. Salário Maternidade	|__| Não |__| Sim	**1.37.5.** R$ _____
1.36.6. Trabalhou em alguns momentos, por exemplo, trabalhou na coleta de mel, construiu uma casa, trabalhou na loja da Associação por um período no ano.	|__| Não |__| Sim	**1.37.6.** R$ _____
1.36.7. Trabalho com salário fixo, por exemplo, agente de saúde, professor	|__| Não |__| Sim	**1.37.7.** R$ _____

1.36. *SE SIM:* De onde você ganhou este dinheiro?		**1.37.** Quanto foi que você recebeu (em reais)?
1.36.8. Venda de artesanato, por exemplo, colares, cestos, esteira, cocar	|__| Não |__| Sim	**1.37.8.** R$ _____
1.36.9. Venda de peixes	|__| Não |__| Sim	**1.37.9.** R$ _____
1.36.10. Venda de carne de caça	|__| Não |__| Sim	**1.37.10.** R$ _____
1.36.11. Venda de animais de criação do quintal, por exemplo, galinha	|__| Não |__| Sim	**1.37.11.** R$ _____
1.36.12. Venda de produtos da floresta, por exemplo mel, óleo de pequi	|__| Não |__| Sim	**1.37.12.** R$ _____
1.36.13. Venda de alimentos do quintal ou da roça	|__| Não |__| Sim	**1.37.13.** R$ _____
1.36.14. Dinheiro emprestado ou dado por amigo(s) ou alguém da sua família	|__| Não |__| Sim	**1.37.14.** R$ _____
1.36.15. Outro. Qual? _____	|__| Não |__| Sim	**1.37.15.** R$ _____

1.38. No ano passado, ou seja, do mês de agosto do ano passado até este mês, você ganhou algum dinheiro? |__| Não |__| Sim *(Se **NÃO** → pular para a questão 1.41.)*

1.39. *SE SIM:* De onde você ganhou este dinheiro?		**1.40.** Quanto foi que você recebeu (em reais)?
1.39.1. Aposentadoria	|__| Não |__| Sim	**1.40.1.** R$ _____
1.39.2. Auxílio-doença	|__| Não |__| Sim	**1.40.2.** R$ _____
1.39.3. Programa Bolsa Família	|__| Não |__| Sim	**1.40.3.** R$ _____
1.39.4. Pensão por morte	|__| Não |__| Sim	**1.40.4.** R$ _____
1.39.5. Salário Maternidade	|__| Não |__| Sim	**1.40.5.** R$ _____
1.39.6. Trabalhou em alguns momentos, por exemplo, trabalhou na coleta de mel, construiu uma casa, trabalhou na loja da Associação por um período no ano.	|__| Não |__| Sim	**1.40.6.** R$ _____
1.39.7. Trabalho com salário fixo, por exemplo, agente de saúde, professor	|__| Não |__| Sim	**1.40.7.** R$ _____
1.39.8. Venda de artesanato, por exemplo, colares, cestos, esteira, cocar	|__| Não |__| Sim	**1.40.8.** R$ _____
1.39.9. Venda de peixes	|__| Não |__| Sim	**1.40.9.** R$ _____
1.39.10. Venda de carne de caça	|__| Não |__| Sim	**1.40.10.** R$ _____
1.39.11. Venda de animais de criação do quintal, por exemplo, galinha	|__| Não |__| Sim	**1.40.11.** R$ _____
1.39.12. Venda de produtos da floresta, por exemplo mel, óleo de pequi	|__| Não |__| Sim	**1.40.12.** R$ _____
1.39.13. Venda de alimentos do quintal ou da roça	|__| Não |__| Sim	**1.40.13.** R$ _____
1.39.14. Dinheiro emprestado ou dado por amigo(s) ou alguém da sua família	|__| Não |__| Sim	**1.40.14.** R$
1.39.15. Outro. Qual? _____	|__| Não |__| Sim	**1.40.15.** R$ _____

Nesta parte da entrevista eu vou querer saber sobre o que você acredita em relação a vida, morte, quem criou os animais, o que os brancos chamam de religião ou crença.

1.41. Você tem alguma religião? |__| Não |__| Sim *(Se **NÃO** → pular para a questão 1.43.)*

1.42. Se sim, qual? _____

Agora quero saber o que você pensa sobre o governo e de como você fica sabendo das notícias que acontecem fora da aldeia.

1.43. Como o governo brasileiro age com os povos indígenas? _____

1.44. Como o governo age com a população não indígena? _____

1.45. Você votou na última eleição, em 2018? |__| Não |__| Sim *(Se **NÃO** → pular para a questão 1.48.)*

1.46. Na última eleição em quem você votou para presidente no primeiro turno? |__| Jair Bolsonaro *(PSL)* |__| Fernando Haddad *(PT)* |__| Ciro Gomes *(PDT)* |__| Geraldo Alckmin *(PSDB)* |__| Marina Silva *(REDE)* |__| Guilherme Boulos *(PSOL)* |__| João Amoedo *(NOVO)* |__| Cabo Daciolo *(PATRI)* |__| Henrique Meirelles *(MDB)* |__| Alvaro Dias *(PODE)* |__| Vera *(PSTU)* |__| Eymael *(DC)* |__| João Goulart Filho *(PPL)* |__| Só votei no segundo turno. |__| Nulo/Branco.

1.47. E no segundo turno? |__| Jair Bolsonaro *(PSL)* |__| Fernando Haddad *(PT)* |__| Só votei no primeiro turno. |__| Nulo/Branco.

1.48. Ao menos uma vez no mês passado, ou seja, do dia ___ ao dia de hoje, você:	**1.49.** Quantos dias você _____ *(preencher com atividade)* no mês passado?	**1.50.** Nas vezes que você _____ *(preencher com atividade)*, você se lembra de ter visto ou ouvido falar sobre sol muito quente, chuva muito forte, raios, inundação, furacão, neve?
1.48.1. Assistiu televisão |__| Não |__| Sim *(Se **NÃO** → ir para questão 1.50.1.)*	**1.49.1.** |__||__| dias	**1.50.1.** |__| Não |__| Sim

1.48. Ao menos uma vez no mês passado, ou seja, do dia ___ ao dia de hoje, você:	**1.49.** Quantos dias você _____ *(preencher com atividade)* no mês passado?	**1.50.** Nas vezes que você _____ *(preencher com atividade)*, você se lembra de ter visto ou ouvido falar sobre sol muito quente, chuva muito forte, raios, inundação, furacão, neve?
1.48.2. Ouviu rádio |__| Não |__| Sim *(Se **NÃO** → ir para questão 1.50.2.)*	**1.49.2.** |__||__| dias	**1.50.2.** |__| Não |__| Sim
1.48.3. Leu revista, jornal, ou algum livro |__| Não |__| Sim *(Se **NÃO** → ir para questão 1.50.3.)*	**1.49.3.** |__||__| dias	**1.50.3.** |__| Não |__| Sim
1.48.4. Entrou no facebook, instagram, e-mail, sites na internet |__| Não |__| Sim *(Se **NÃO** → ir para questão 1.50.4.)*	**1.49.4.** |__||__| dias	**1.50.4.** |__| Não |__| Sim

Agora vou perguntar sobre o tempo da chuva e da seca, e também algumas coisas sobre a roça.

1.51. Quais são os sinais da natureza que indicam que vai começar o tempo da chuva? _____

1.52. Nos dias de hoje, estes sinais continuam ainda indicando o início do tempo da chuva? |__| Não |__| Sim

1.53. Quais os sinais da natureza que marcam o final do tempo da chuva e o início do tempo da seca? _____

1.54. Nos dias de hoje, estes sinais continuam ainda indicando o fim do tempo da chuva? |__| Não |__| Sim

1.55. Para você, quando é o início do tempo da chuva, ou seja, quando começa a cair as primeiras chuvas?	|__| No primeiro dia que começa a chover forte. |__| Após alguns dias seguidos de chuva, por exemplo, 2 a 4 dias seguidos chovendo. |__| Quando a terra está molhada ou úmida, ou seja, nem está seca e nem está alagada de água. |__| Observo o movimento e tamanho das nuvens que indicam que vai chover forte. |__| Vejo a posição das estrelas. |__| Quando chove todos os dias há mais de 1 semana. |__| Outro sinal. Qual? _____

1.56. Qual mês começou a cair as primeiras chuvas no ano passado, em 2018? |__| Janeiro |__| Fevereiro |__| Março |__| Abril |__| Maio |__| Junho |__| Julho |__| Agosto |__| Setembro |__| Outubro |__| Novembro |__| Dezembro |__| Não me lembro.

1.57. Qual mês começou a cair as primeiras chuvas há dois anos atrás, em 2017? |__| Janeiro |__| Fevereiro |__| Março |__| Abril |__| Maio |__| Junho |__| Julho |__| Agosto |__| Setembro |__| Outubro |__| Novembro |__| Dezembro |__| Não me lembro.

1.58. Qual mês começou a cair as primeiras chuvas há três anos atrás, em 2016? |__| Janeiro |__| Fevereiro |__| Março |__| Abril |__| Maio |__| Junho |__| Julho |__| Agosto |__| Setembro |__| Outubro |__| Novembro |__| Dezembro |__| Não me lembro.

1.59. Qual mês começou a cair as primeiras chuvas há quatro anos atrás, em 2015? |__| Janeiro |__| Fevereiro |__| Março |__| Abril |__| Maio |__| Junho |__| Julho |__| Agosto |__| Setembro |__| Outubro |__| Novembro |__| Dezembro |__| Não me lembro.

1.60. Qual mês começou a cair as primeiras chuvas há dez anos atrás, em 2009? |__| Janeiro |__| Fevereiro |__| Março |__| Abril |__| Maio |__| Junho |__| Julho |__| Agosto |__| Setembro |__| Outubro |__| Novembro |__| Dezembro |__| Não me lembro.

1.61. Qual mês começou a cair as primeiras chuvas neste ano, em 2019?	**1.62.** Quanto tempo durou a chuva? Por exemplo, de janeiro à abril.	**1.63.** Nos próximos meses, qual mês que você acha que vai começar a chover novamente?

|__| Janeiro |__| Fevereiro |__| Março |__| Abril |__| Maio |__| Junho |__| Julho |__| Não me lembro.	_____	|__| Agosto |__| Setembro |__| Outubro |__| Novembro |__| Dezembro

1.64. Quando que é o momento que você deve começar a plantar mandioca na roça?	|__| Após alguns dias seguidos de chuva, por exemplo, 2 a 4 dias seguidos chovendo. |__| No primeiro dia que começa a chover forte. |__| Quando a terra está molhada ou úmida, ou seja, nem está seca e nem está alagada de água |__| Espera por uma data especial, por exemplo, no dia 5 de setembro eu irei plantar, pois eu ou meus parentes plantaram nesta data no ano passado e nos outros anos. |__| Espera quando as chuvas não param de cair, ou seja, chove todos os dias há mais de 1 semana. |__| Olha a posição das estrelas. |__| Outro sinal. Qual? _____
1.65. E outros produtos que você vai plantar na roça, quando que é o momento que decide plantá-los?	|__| Após alguns dias seguidos de chuva, por exemplo, 2 a 4 dias seguidos chovendo. |__| No primeiro dia que começa a chover forte. |__| Quando a terra está molhada ou úmida, ou seja, nem está seca e nem está alagada de água |__| Espera por uma data especial, por exemplo, no dia 5 de setembro eu irei plantar, pois eu ou meus parentes plantaram nesta data no ano passado e nos outros anos. |__| Espera quando as chuvas não param de cair, ou seja, chove todos os dias há mais de 1 semana. |__| Olha a posição das estrelas. |__| Outro sinal. Qual? _____

1.66. Já aconteceu de você plantar e não chover o bastante para que as plantas crescessem? |__| Não |__| Sim

1.67. Qual mês você plantou mandioca no ano passado, em 2018? |__| Janeiro |__| Fevereiro |__| Março |__| Abril |__| Maio |__| Junho |__| Julho |__| Agosto |__| Setembro |__| Outubro |__| Novembro |__| Dezembro |__| Não me lembro.

1.68. Qual mês você plantou mandioca há dois anos atrás, em 2017? |__| Janeiro |__| Fevereiro |__| Março |__| Abril |__| Maio |__| Junho |__| Julho |__| Agosto |__| Setembro |__| Outubro |__| Novembro |__| Dezembro |__| Não me lembro.

1.69. Qual mês você plantou mandioca há três anos atrás, em 2016? |__| Janeiro |__| Fevereiro |__| Março |__| Abril |__| Maio |__| Junho |__| Julho |__| Agosto |__| Setembro |__| Outubro |__| Novembro |__| Dezembro |__| Não me lembro.

1.70. Qual mês você plantou mandioca há quatro anos atrás, em 2015? |__| Janeiro |__| Fevereiro |__| Março |__| Abril |__| Maio |__| Junho |__| Julho |__| Agosto |__| Setembro |__| Outubro |__| Novembro |__| Dezembro |__| Não me lembro.

1.71. Qual mês você plantou mandioca há dez anos atrás, em 2009? |__| Janeiro |__| Fevereiro |__| Março |__| Abril |__| Maio |__| Junho |__| Julho |__| Agosto |__| Setembro |__| Outubro |__| Novembro |__| Dezembro |__| Não me lembro.

1.72. Quais meses você plantou ou vai plantar mandioca neste ano, em 2019? _____.

II – INFORMAÇÕES SOBRE O CLIMA

Agora eu vou perguntar o que está mudando no clima e na mata. Clima é o tempo, como frio, calor, chuva, vento que está fazendo durante um período grande, como vários anos seguidos. Para responder as próximas perguntas, quero que você pense na região da Terra Indígena Wawi, que é onde você mora hoje ou no Parque Indígena do Xingu, que você pode já ter morado ou visitado um dia.

2.1. Você acha que mudou alguma coisa no clima, como no tempo da chuva e da seca, de quando você era criança até hoje? |__| Não |__| Sim *(Se Não → ir para 2.3.)*

2.2. Na sua opinião, qual o motivo do clima estar mudando? (*Marcar apenas uma resposta)*	|__| A própria natureza está mudando |__| As pessoas que estão fazendo isso, por exemplo, quando cortam árvores, sujam os rios e o ar, constroem hidrelétricas, criam gado, ou queimam as florestas |__| Os espíritos que estão fazendo isso, porque estão bravos com as pessoas

	|__| Isso é causado pela própria natureza que está mudando, e pelas pessoas que estão desmatando, sujando a natureza, queimando as florestas, etc. |__| Não acho que está ocorrendo mudanças e nem vai ocorrer |__| Não tenho informações suficientes para saber com certeza se a mudança no clima está ocorrendo ou não |__| Outro motivo. Qual? _____.

Além de se lembrar que clima é o tempo que faz durante vários anos seguidos, quero que pense nos últimos 20 anos para responder as próximas perguntas. Caso você tenha 18 anos, quero que se lembre desde quando era uma criança. Então, pensando na chuva, no vento, nos rios, no calor e no frio, nos últimos 20 anos na Terra Indígena Wawi ou na região do Parque Indígena do Xingu até esse ano de 2019:

2.3. Você lembra de algum acontecimento que ocorreu, que você não achou que foi normal ou que você nunca tinha visto acontecer antes, por exemplo, uma seca muito grande ou ficar sem chover por muito tempo? |__| Não |__| Sim *(Se Não → Ir para questão 2.4.).*

2.3.1. O que aconteceu e quanto tempo durou? _____

2.3.2. Qual ano que isso aconteceu? _____

2.4. Os períodos de frio, ou seja, os vários dias seguidos que faz frio estão iguais quando era criança, diminuíram ou aumentaram? |__| Iguais quando era criança |__| Diminuíram |__| Aumentaram

2.5. E os períodos de calor, que são vários dias seguidos que faz mais calor do que frio, estão iguais quando era criança, diminuíram ou aumentaram? |__| Iguais quando era criança |__| Diminuíram |__| Aumentaram

2.6. A duração do tempo da seca, quando não chove, estão iguais quando era criança, diminuíram ou aumentaram? |__| Iguais quando era criança |__| Diminuíram |__| Aumentaram

2.7. E a duração do tempo da chuva, estão iguais quando era criança, diminuíram ou aumentaram? |__| Iguais quando era criança |__| Diminuíram |__| Aumentaram

2.8. Os ventos fortes, que podem derrubar casas, estão iguais quando era criança, diminuíram ou aumentaram? |__| Iguais quando era criança |__| Diminuíram |__| Aumentaram

2.9. A quantidade de raios, estão iguais quando era criança, diminuíram ou aumentaram? |__| Iguais quando era criança |__| Diminuíram |__| Aumentaram

2.10. As chuvas muito fortes, com ventos que podem derrubar árvores e casas, estão iguais quando era criança, diminuíram ou aumentaram? |__| Iguais quando era criança |__| Diminuíram |__| Aumentaram

2.11. Os ventos fortes de poeira estão iguais quando era criança, diminuíram ou aumentaram? |__| Iguais quando era criança |__| Diminuíram |__| Aumentaram

2.12. Os incêndios que acontecem sozinhos na mata, estão iguais quando era criança, diminuíram ou aumentaram? |__| Iguais quando era criança |__| Diminuíram |__| Aumentaram

2.13. O sol forte está igual quando era criança, diminuiu ou aumentou? |__| Iguais quando era criança |__| Diminuíram |__| Aumentaram

2.14. Os animais que vivem próximo ou dentro das duas Terras Indígenas estão tendo comida suficiente para sobreviver? |__| Não |__| Sim |__| Depende do animal. Qual? _____ *(Se responder Sim → ir para questão 2.15.).*

2.14.1. Por que isso estaria acontecendo? |__| Desmatamento |__| Clima mudando |__| Árvores morrendo |__| Rio contaminado |__| Outro motivo?. Qual_____

2.15. Os animais que vivem próximo ou dentro das duas Terras Indígenas estão tendo filhotes mais cedo, mais tarde ou continua igual era há 20 anos atrás? |__| Mais cedo |__| Mais tarde |__| Continua igual há 20 anos |__| Depende do animal. Qual? _____. *(Se responder Continua igual → ir para questão 2.16.).*

2.15.1. Por que isso estaria acontecendo? |__| Desmatamento |__| Clima mudando |__| Árvores morrendo |__| Rio contaminado |__| Outro motivo? Qual_____

2.16. A quantidade de animais que vivem próximo ou dentro das duas Terras Indígenas diminuíram, aumentaram ou continua igual há 20 anos atrás? |__| Diminuíram |__| Aumentaram |__| Continua igual há 20 anos |__| Depende do animal. Qual? _____. *(Se responder Continua igual → ir para questão 2.17.).*

2.16.1. Por que isso estaria acontecendo? |__| Desmatamento |__| Clima mudando |__| Árvores morrendo |__| Rio contaminado |__| Sem comida na mata |__| Muita comida na mata |__| Outro motivo? Qual_____

2.17. A quantidade de peixes que existem no rio Suiá-Miçú ou no rio Pacas diminuíram, aumentaram ou continua igual há 20 anos atrás? |__| Diminuíram |__| Aumentaram |__| Continua igual há 20 anos |__| Depende do peixe. Qual? _____. *(Se responder Continua igual → ir para questão 2.18.).*

2.17.1. Por que isso estaria acontecendo? |__| Desmatamento |__| Clima mudando |__| Sem comida pros peixes (rio, mata) |__| Rio contaminado |__| Muita comida pros peixes (rio, mata) |__| Outro motivo? Qual_____

2.18. A quantidade de formigas, moscas, besouros, gafanhoto e outros insetos que existem nas duas Terras Indígenas diminuíram, aumentaram ou continuam iguais há 20 anos atrás? |__| Diminuíram |__| Aumentaram |__| Continua igual há 20 anos |__| Depende do inseto. Qual? _____. *(Se responder Continua igual → ir para questão 2.19.).*

2.18.1. Por que isso estaria acontecendo? |__| Desmatamento |__| Clima mudando |__| Árvores morrendo |__| Sem comida na mata |__| Muita comida na mata |__| Outro motivo? Qual_____

2.19. Nos últimos 20 anos, a quantidade de aves que existem no Parque Indígena do Xingu ou na Terra Indígena Wawi diminuíram, aumentaram ou continuam iguais há 20 anos atrás? |__| Diminuíram |__| Aumentaram |__| Continua igual há 20 anos |__| Depende da ave. Qual? _____. *(Se responder Continua igual → ir para questão 2.20.).*

2.19.1. Por que isso estaria acontecendo? |__| Desmatamento |__| Clima mudando |__| Árvores morrendo |__| Rio contaminado |__| Sem comida na mata |__| Muita comida na mata |__| Outro motivo? Qual_____

2.20. As plantas das duas Terras Indígenas estão florescendo e dando frutas(os) mais cedo, mais tarde ou continua igual há 20 anos atrás? |__| Mais cedo |__| Mais tarde |__| Continua igual há 20 anos |__| Depende da planta. Qual? _____. *(Se responder Continua igual → ir para questão 2.21.).*

2.20.1. Por que isso estaria acontecendo? |__| Desmatamento |__| Clima mudando |__| Outro motivo? Qual_____

Os pesquisadores dizem que as mudanças que podem acontecer no futuro são: diminuição das chuvas, aumento dos dias secos e do tempo seco, os dias ficarão mais quentes, a vegetação poderia mudar. O desmatamento seria muito ruim e iria piorar a situação.

2.21. Você está preparado para essas mudanças? |__| Não |__| Sim	**2.22.** Você acha que a comunidade está preparada? |__| Não |__| Sim	**2.23.** Você acha que as outras aldeias e povos do Xingu estão preparados para isso? |__| Não |__| Sim

2.24. Pensando nisso, o que você acha que vai acontecer com a sua roça? _____.

2.25. Pensando nisso, o que você acha que vai acontecer com a sua comunidade? _____.

2.26. O que você acha que você pode fazer para evitar problemas com a mudança do clima? _____

2.27. O que você acha que a comunidade pode fazer para evitar problemas com a mudança do clima? _____

Apêndice C – Autorização FUNAI.

0926846 08620.013206/2018-41

MINISTÉRIO DA JUSTIÇA
FUNDAÇÃO NACIONAL DO ÍNDIO

Autorização de Ingresso em Terra Indígena nº 94/AAEP/PRES/2018

IDENTIFICAÇÃO			
NOME:	Lia Taruiap Troncarelli	PROCESSO Nº:	08620.013206/2018-41
NACIONALIDADE:	Brasileira	IDENTIDADE:	n° 35.811.915-7 SSP/SP
INSTITUIÇÃO/ENTIDADE:	Instituto de Energia e Ambiente Universidade de São Paulo		
PATROCINADOR:			

OBJETIVO DO INGRESSO
Realizar da pesquisa científica intitulada:**"EFEITOS DAS MUDANÇAS CLIMÁTICAS SOBRE AS ATIVIDADES DE SUBSISTÊNCIA DOS KTSÊDJÊ E SUAS ESTRATÉGIAS DE ADAPTAÇÃO"**

EQUIPE DE TRABALHO		
NOME	NACIONALIDADE	DOCUMENTO
Priscila dos Reis Cunha	Brasileira	RG nº 43.964.609-1 - SSP/SP

LOCALIZAÇÃO			
TERRA INDÍGENA:	Wawi/Aldeias: Ngôjhwêrê, Khikhatxi, Ngôsokô, Jarumã e HorehusTkro	POVO INDÍGENA:	Kisêdjê
COORDENAÇÃO REGIONAL:	Xingu	CTL:	

VIGÊNCIA DA AUTORIZAÇÃO			
INÍCIO:	16 de novembro de 2018	TÉRMINO:	31 de dezembro de 2023.

Autorizo.

Brasília-DF, 13 de novembro de 2018.

RESSALVAS:

- Esta autorização não inclui licença para uso de imagem, som e som de voz dos indígenas, para além do objeto desta autorização;
- Esta autorização não inclui acesso ao conhecimento tradicional associado à biodiversidade;
- Esta autorização não inclui acesso ao patrimônio genético;

- Remeter à Assessoria de Acompanhamento aos Estudos e Pesquisas – AAEP/Presidência/Funai, mídia digital contendo: relatórios, artigos, livros, gravações audiovisuais, imagens, sons, outras produções oriundas do trabalho realizado e informações sobre o acesso na internet.

Documento assinado eletronicamente por **Wallace Moreira Bastos**, **Presidente**, em 14/11/2018, às 08:58, conforme horário oficial de Brasília, com fundamento no art. 6º, § 1º, do Decreto nº 8.539, de 8 de outubro de 2015.

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Referência: Processo nº 08620.013206/2018-41 SEI nº 0926846

Apêndice D – Autorização CONEP/CEP.

PARECER CONSUBSTANCIADO DA CONEP

DADOS DO PROJETO DE PESQUISA

Título da Pesquisa: Efeitos das Mudanças Climáticas sobre as Atividades de Subsistência dos K¿sêdjê e suas Estratégias de Adaptação

Pesquisador: LIA TARUIAP TRONCARELLI

Área Temática: Estudos com populações indígenas;

Versão: 3

CAAE: 97750818.9.0000.5390

Instituição Proponente: UNIVERSIDADE DE SAO PAULO

Patrocinador Principal: Financiamento Próprio

DADOS DO PARECER

Número do Parecer: 3.050.863

Apresentação do Projeto:

As informações elencadas nos campos “Apresentação do Projeto”, “Objetivo da Pesquisa” e “Avaliação dos Riscos e Benefícios” foram retiradas do arquivo (PB_INFORMAÇÕES_BÁSICAS_DO_PROJETO_1194832.pdf de 13/11/2018) e o restante do texto do último parecer pendente emitido pela Conep no dia 05/10/2018 (PB_PARECER_CONSUBSTANCIADO_CONEP_2942690.pdf).

INTRODUÇÃO

Mudanças climáticas são as alterações no estado do clima, que persistem por décadas ou períodos mais longos, podendo ter origem em causas naturais, por exemplo, erupções vulcânicas e variações nos ciclos solares, ou antrópicas, como a emissão de gases de efeito estufa (Ipcc, 2013).Embora possam ter origem natural, é inquestionável que um dos maiores problemas atuais da humanidade são as mudanças induzidas por atividades antrópicas (Moran, 2011). Evidências científicas, a partir da análise dos oceanos, da atmosfera, da terra e da criosfera (Lal et al., 2011;Ipcc, 2013), e por meio de modelos numéricos, observação (e.g., in situ, satélites, registros do passado), ferramentas estatísticas, medições por radiossondas, ou até mesmo por proxies das variáveis climáticas, como pólen, anéis arbóreos e núcleos de gelo, auxiliam cientistas a identificar varrições não naturais, assim como a preverem potenciais mudanças e cenários futuros. Por esses meios, cientistas evidenciaram que, nas últimas décadas, o mundo experimentou alterações,

explicadas principalmente por atividades humanas (Ipcc, 2013). Dentre essas, nota-se o aumento do calor nos oceanos e da temperatura média global do ar; mudanças na salinidade e acidificação dos oceanos; aumento da temperatura da superfície da terra e do mar; diminuição das geleiras e do gelo marinho do Ártico; aumento da concentração de dióxido de carbono e outros gases de efeito estufa; mudanças na precipitação e aumento da incidência de eventos extremos (Ipcc, 2013). As mudanças climáticas afetam, em diferentes escalas, toda a humanidade, seja ambientalmente, socialmente ou economicamente (Bele, Tiani, et al., 2013; Keenan, 2015), tendo implicações para a saúde e o bem-estar de todos (Mendelsohn et al., 2006; Willox et al., 2015). Apesar dos países desenvolvidos terem mais responsabilidade sobre as alterações climáticas (Mendelsohn et al., 2006), os mais vulneráveis e impactados são habitantes de países em desenvolvimento, inclusive povos indígenas, especialmente aqueles que se encontram em situação de pobreza ou extrema pobreza (Ipcc, 2014a). Embora os 5.000 grupos indígenas existentes no mundo variem em termos de padrões socioculturais, tamanho, história, língua e estratégias econômicas (SurvivalInternational, 2015), usualmente, enfrentam altas taxas de pobreza e privação quando comparados às populações não indígenas (Kanbur eVenables, 2005; Turner e Clifton, 2009; Hall e Patrinos, 2012; Leichenko e Silva, 2014). Ademais, grande parte dos indígenas depende de recursos naturais para sua subsistência e, devido à alteração dos ciclos naturais, são bastante vulneráveis às mudanças climáticas (Gerrard, 2008; Macchi etal., 2008; Ford, 2012; Aryal et al., 2014). Essa vulnerabilidade, i.e. a susceptibilidade ou predisposição de um sistema de ser impactado negativamente, de lidar e adaptar-se aos efeitos das mudanças climáticas (Ipcc, 2014d), os afeta de diferentes maneiras e em diferentes escalas(Iucn, 2016). De modo geral, povos indígenas do mundo são afetados em suas atividades de subsistência, na nutrição e na saúde, assim como em aspectos culturais, como o compartilhamento de bens, a transmissão cultural e o conhecimento tradicional (Macchi et al., 2008).Diversas evidências mostram impactos negativos à subsistência de povos indígenas. Por exemplo, na Bolívia, os Quechua descreveram que a plantação de batatas está sendo prejudicada, pois o clima está mais quente, as geadas e chuvas estão imprevisíveis, os ventos, além de mais fortes, estão mudando sua direção, e aumentou a ocorrência de chuvas com granizo (Boillat e Berkes, 2013). Na fronteira da Índia com a China, indígenas relataram mudanças nas estações do ano, assim como no florescimento de algumas espécies (Ingty, 2017). A floração precoce e mudanças na frutificação também foram observadas no Himalaia (Negi et al., 2017). Já indígenas no Canadá relataram: o aumento da infestação de pragas nas florestas; diminuição ou morte de determinadas espécies de animais; frutificação ou floração fora de época; rios, riachos e lagos secando, e temperaturas incomuns no inverno e no

verão (Turner e Clifton, 2009). Em relação à nutrição e saúde, há também relatos diversos. Oaumento da estação seca, como consequência das mudanças climáticas, por exemplo, foi associada à insegurança alimentar para os Batwa, sociedade indígena da África Subsaariana (Patterson et al., 2016). A incidência de problemas físicos de saúde, como malária, desnutrição, doenças respiratórias e estomacais, também foi observada para o mesmo grupo (Berrang-Ford et al., 2012). Não somente problemas físicos, mas também psicológicos foram observados. Por exemplo, entre indígenas do Norte Circumpolar, constatou -se que as mudanças têm originado casos de depressão, ansiedade, estresse, suicídio, ou mesmo dependência de álcool e outras drogas (Willox et al., 2015). Já no Brasil, há mais de 240 povos indígenas, que habitam 704 terras indígenas, sendo que 55% delas se encontram em regiões da Amazônia (Isa, 2017). Embora, atualmente, grande parte dessas sociedades esteja em regiões bem conservadas, a falta de dados proveniente de estações meteorológicas na Amazônia brasileira torna difícil prever com exatidão o que ocorrerá futuramente nesse bioma (Nobre, Obregón, et al., 2009). Segundo o Painel Brasileiro de Mudanças Climáticas (PBMC), o cenário previsto até 2040 é de reduções percentuais na distribuição de chuvas (10%) e aumento da temperatura entre 1ºC-1,5ºC, sendo que até 2100 o quadro se agravará, podendo chegar a incrementos de 5ºC-6ºC na temperatura e redução de 40-45% nas chuvas(Pbmc, 2014). Como fator agravante a esses cenários, estão as queimadas, que liberam partículas de aerossóis à atmosfera, e mudanças no uso daterra, como o desmatamento (Pbmc, 2014), que afetam a dinâmica do processo de circulação atmosférica e a física das nuvens, afetando o ciclo hidrológico e a precipitação na região (Nobre, Marengo, et al., 2009). Modelagem numérica e estudos observacionais também sugerem que, caso o desmatamento atinja 40%, haverá aumento da estação seca, decorrente da diminuição das chuvas de julho a novembro, e aquecimento dasuperfície em até 4ºC (Pbmc, 2014). Já a previsão do quinto relatório do IPCC (AR5) é de que aumentará a temperatura, o uso da terra para agricultura e os vetores que transmitem dengue, malária e febre amarela, enquanto a cobertura florestal diminuirá, e a precipitação e o escoamento de água dos rios poderá aumentar ou diminuir (Ipcc, 2014b). Assim como em outras regiões do mundo, já existem evidências de problemas causados pelas mudanças climáticas para a Amazônia, como é o caso das atividades de subsistência de indígenas nas porções peruana e boliviana. Por exemplo, os indígenas no Peru estão substituindo a caça pela pesca, em decorrência das grandes inundações ocorridas entre 2009 a2015, que diminuíram a quantidade de animais (Bodmer et al., 2018). Já os indígenas na Bolívia relataram incrementos na precipitação e nas inundações, mas também que os períodos de seca se tornaram mais longos, reduzindo o volume de água dos rios e afetando negativamente apesca (Ruiz-Mallén et al., 2017). Também na

Amazônia brasileira, pesquisas com populações rurais no Pará mostram que o aumento de eventosmais extremos, como o fogo, a seca prolongada e o tempo em que os locais permanecem inundados podem afetar o uso da terra, a subsistência, as atividades econômicas, a saúde, a segurança alimentar e causar violência social (Brondizio e Moran, 2008). Portanto, apresento três hipóteses da pesquisa. Hipótese 1. As mudanças climáticas previstas e em curso estariam causando mais efeitos negativos do que positivos às atividades desubsistência praticadas pelos Ksêdjê e, com isso, aumentando a dependência de produtos comprados nas cidades. Esses efeitos seriam maiores para a agricultura e para a pesca, mas menores para a coleta. Portanto, os Ksêdjê estariam investimento menos tempo na agricultura e pesca, e mais tempo na coleta. Espera-se, primeiro, que a dedicação à agricultura esteja diminuindo e que a importância relativa dos diferentes cultivos seja alterada, posto que: (i) as condições climáticas tornaram-se menos propícias e mais incertas (seca, incerteza e redução das precipitações) (Pbmc,2014); (ii) os efeitos são aumentados com a sinergia com outras mudanças ambientais, especialmente o desmatamento no entorno dos territórios.Essa hipótese está em consonância com o previsto das mudanças climáticas pela literatura, que devem afetar sobretudo sociedades altamente dependentes de recursos naturais (Morton, 2007; Bele, Sonwa, et al., 2013), como os povos indígenas (Ford, 2012). Esses povos já lidam compressões socioeconômicas e ambientais (Halder et al., 2012), com efeitos para o fornecimento de alimentos e, consequentemente, segurança alimentar (Patterson et al., 2016). A agricultura tem sido uma das atividades de subsistência mais impactadas pelas mudanças climáticas, pela alta dependência direta de fatores climáticos como temperatura, disponibilidade de água e ventos, assim como vulnerabilidade a inundações, doenças epragas, que podem ser potencializados pelas alterações (Bele, Sonwa, et al., 2013; Nkem et al., 2013). Na literatura, há diversos efeitos negativos reportados. Primeiro, vários estudos observaram redução na produtividade agrícola devido a menores precipitações, efeito observado em climas frios como do Nepal (Dangi et al., 2018) e Himalaia (Negi et al., 2017), mas também em localidades tropicais como a Índia (Halder et al., 2012),África Meridional (especificamente no Zimbábue) (Mapfumo et al., 2016) e em regiões do Chaco boliviano, habitadas pelos Guarani de Tentami (Dávalos, 2017). Pelo contrário, em outros locais, como nos Andes bolivianos, são as fortes chuvas, acompanhadas de granizo, que reduzem aprodutividade, ao danificar certas culturas e provocar deslizamentos de terra (Boillat e Berkes, 2013). O segundo fator muito citado que afeta a produtividade é o aumento na incidência de pragas e de doenças agrícolas, como observado no Nepal (Dangi et al., 2018), Himalaia (Negi et al.,2017), nos Andes bolivianos dos Quechua (Boillat e Berkes, 2013). Em terceiro lugar, constam as alterações nos cultivos adotados, posto que a produtividades de certas culturas

é mais afetada do que outras, o que pode levar à perda de agrobiodiversidade, como reportado noZimbábue(Mapfumo et al., 2016). Por exemplo, trigo e batata foram mais afetados no Nepal (Dangi et al., 2018); arroz, milho e amendoim foram abandonado sem vilas pertencentes a três Estados da Índia (Madhya Pradesh, Chhattisgarh e Odisha) (Halder et al., 2012).Em segundo lugar, espera-se que a dedicação à pesca esteja diminuindo, e que a atividade também seja impactada negativamente, pois (i) períodos maiores e mais severos de seca na região levam à redução no volume dos rios e na produtividade da pesca; (ii) os efeitos são aumentados com a sinergia com outras mudanças, como a poluição (e.g., defensivos agrícolas) e o desmatamento. Existem evidências na literatura que comprovam que a pesca seja negativamente afetada. No Canadá, o povo Inuit relatou que os peixes estão diminuindo devido às mudanças na saúde e distribuição de algumas espécies de plantas que servem de alimento aos peixes, e por conta disso, os Inuit estariam aumentando o consumo de alimentos vindos dos mercados (Rosol et al., 2016).A mesma diminuição na oferta de peixes foi observada na Amazônia boliviana (Ruiz-Mallén et al., 2017) e na Bacia do Congo, na África (Nkem et al.,2013), em razão da seca dos rios. Para a coleta de produtos florestais, a literatura existente mostra evidências de efeitos contraditórios. Por um lado, no Himalaia, foi relatada redução na oferta de produtos florestais não madeireiros (PFNM) e madeireiros disponíveis (Negi et al., 2017). Por outro lado, previsões realizadas para as mudanças climáticas em Camarões e algumas regiões na bacia do Congo, na África, indicaram que a floresta eos recursos florestais serão menos afetados do que a agricultura, devido à maior capacidade de resiliência da floresta, explicada pela sua diversidade (Bele, Tiani, et al., 2013), pois sistemas com maior biodiversidade seriam mais resistentes à variabilidade climática do que sistemas menos diversos (Isbell et al., 2015; Wunder et al., 2018). Portanto, espera-se que para os Ksêdjê, a dedicação à coleta esteja aumentando, e esta atividade seja menos afetada, pois eles estariam plantando PFNM, dentre eles Caryocar brasiliense Camb., e deste modo: (i) diversificando a fonte de alimentos e a renda monetária proveniente da venda de PFNM e, (ii) melhorando a oferta de serviços ecossistêmicos, além de ajudar o ambientea estar mais resistente aos choques e mudanças advindas das mudanças climáticas (Locatelli et al., 2008). Hipótese 2. Os efeitos das mudanças climáticas devem ser mediados pelo comportamento das pessoas frente ao risco. Partindo da teoria do prospecto, os Kisêdjê considerariam as perdas e os ganhos da escolha na tomada de decisão, sendo influenciados por emoções, limitações cognitivas ou pelo contexto. Esse comportamento variaria entre homens e mulheres, segundo diferentes faixas etárias, sendo que os homens mais jovens seriam mais buscadores de risco do que as mulheres mais jovens e as pessoas mais velhas. As mudanças climáticas criam diversos riscos à sociedade como um todo e,

portanto, avaliá-los e entendê-los é importante (Adger et al., 2018). Para os tomadores dedecisão, como sociedades indígenas, esses efeitos dependem não somente de alterações nas condições climáticas e consequências para o ambiente que os afetam, como também do comportamento individual. Por sua vez, o comportamento é influenciado, dentre outros fatores, pela percepção dos riscos associados às mudanças climáticas e à adoção de estratégias de adaptação e mitigação de seus efeitos (Smith, 2018). Duas linhas teóricas principais em Economia auxiliam a entender este comportamento: a primeira baseada na Teoria da Escolha Racional, enquanto a segunda em modelos alternativos não-racionais, especialmente da Economia Comportamental. Baseada na Economia Neoclássica, a abordagem da Teoria da Escolha Racional é amplamente utilizada em diferentes áreas do conhecimento. Em sua vertente da Utilidade Esperada , esta teoria assume que as decisões das pessoas são baseadas em escolhas racionais (ver (De Jonge, 2012), baseadas em preferências que são consistentes(i.e., as escolhas não mudam conforme o contexto) (Simon, 1955; Macfayden, 2006). Portanto, as decisões teriam por objetivo maximizar a utilidade(Gigerenzer e Selten, 2002; Mckenzie, 2010), que poderia equivaler, em diferentes modelos, a maximizar aspectos objetivos como os retornos financeiros, mas também subjetivos como felicidade, satisfação e prazer ou, ainda, minimizar riscos (Ellis, 1988; Tucker, 2007; De Jonge, 2012).Assim, a tomada de decisão ou escolha entre alternativas seria motivada por determinada função da utilidade, partindo da ponderação consciente eintencional dos custos e benefícios das alternativas (Ellis, 1988; Tucker, 2007; Mckenzie, 2010). Em populações rurais vulneráveis, ou cujo sustentos e baseia ao menos parcialmente em atividades de subsistência (i.e. semi autárquica), a abordagem racionalista tende a assumir que as famílias e os indivíduos são motivados pela minimização do risco, ao invés de maximizar os retornos financeiros, como assumido para outras sociedades (Ellis,1988; Mendola, 2007). A razão disso parte da premissa que populações rurais lidam com diversas incertezas, decorrentes de variações climáticas, desastres naturais, doenças e ou mudanças na legislação (Ellis, 1988). Evidências empíricas corroboraram essa ideia, como de estudo na Índia quemostrou que, quando o risco associado à agricultura é alto, famílias mais vulneráveis investem em sistemas de produção mais conservadores, embora menos lucrativos, como alternativa mais segura às mudanças climáticas (Morduch, 1995). A segunda abordagem, em geral associada à vertente da Economia Comportamental, envolve diversos modelos e teorias que explicam a tomada de decisão sob outras perspectivas (Simon,1955). Por exemplo, na vertente da racionalidade limitada, assume-se que as pessoas não conseguem computar todos os resultados possíveis de suas escolhas (Chibnik, 2011) (World Bank, 2015), por conta das habilidades cognitivas limitadas (Simon, 1955) e da irrealidade de assumir que, na prática, existe

conhecimento perfeito sobre todas as probabilidades, custos e benefíciosenvolvidos nas escolhas (Mckenzie, 2010) (Tucker et al.,2013). Outros modelos, que não da racionalidade limitada, assumem que fatores distintos, além das preferências e dos interesses pessoais,influenciam nas escolhas, como especialmente as emoções, o hábito, as normas e os estereótipos sociais e até mesmo o contexto (portanto, asescolhas não seriam consistentes) (Kahneman e Tversky, 1979; Tversky e Kahneman, 1981; Gigerenzer e Selten, 2002; World Bank, 2015).A Teoria do Prospecto, proposta por Daniel Kahneman e Amos Tversky (1979) a partir de evidências experimentais, é um exemplo de alternativa aos modelos racionais que se pauta na perspectiva do risco. Ao contrário da abordagem racional da Teoria da Utilidade Esperada, que assume preferências estáveis e escolha da opção que maximize a utilidade (Bernoulli, 1954; Hershey e Schoemaker, 1980) independente do contexto da escolha(Tversky e Kahneman, 1981; Gowdy, 2008), a Teoria do Prospecto admite que as preferências não são constantes e mudam conforme o contexto(Tversky e Kahneman, 1981) e são influenciadas por emoções e ilusões cognitivas que produzem erros e vieses na escolha ótima (Altman, 2012).Segundo esta, as pessoas não avaliam de forma equivalente ganhos e perdas, reagindo mais a perdas do que a ganhos (Altman, 2012). Em escolhas que envolvem ganhos, os indivíduos optariam por não se arriscar, escolhendo preferencialmente o cenário com ganho certo em detrimento de ganho provável, sendo, portanto, avessos ao risco. Já em cenários que envolvem perdas, acontece o oposto: as pessoas escolheriam se arriscara ter uma possível perda ao invés de ter uma perda considerada certa, logo seriam buscadoras de risco (Kahneman e Tversky, 1979; Tversky eKahneman, 1981; Kahneman e Tversky, 1984).Portanto, espera-se que os Ksêdjê se comportem frente aos riscos das mudanças climáticas, seguindo a teoria do prospecto. Assim, eles se comportariam considerando as perdas (e.g., com o clima mais seco, alguns rios poderão secar, o que diminuirá a oferta de peixes) e os ganhos (e.g., com o clima mais seco, alguns cultivos na roça irão se adaptar melhor, como a mandioca) que os efeitos das mudanças climáticas lhes trariam, dependendo do contexto apresentado, das emoções e de ilusões cognitivas. Baseado em estudos experimentais diversos, parte-se da hipótese de que na tomada de decisão em situações de risco: (i) as mulheres Ksêdjê serão mais avessas ao risco, pois evidências prévias em outras culturas mostram que elas percebem mais os riscos que os homens (Harris et al., 2006; Smith, 2018); e (ii)os homens serão mais buscadores de risco, pois em outras culturas estes tendem a encarar os riscos como parte da vida, inclusive aceitando conviver com alguns deles (Smith, 2018). E por fim, (iii) a idade influenciará como os Ksêdjê convivem com o risco, e as pessoas mais jovens lidariam melhor com o risco do que as mais velhas, pois podem se adaptar mais rapidamente, uma vez que os idosos possuem rotinas comportamentais e padrões

culturais já estabelecidos, portanto, teriam mais aperder com mudanças de curto prazo (Brondizio e Moran, 2008).Hipótese 3. As principais estratégias de adaptação já adotadas ou que os Ksêdjê pretendem adotar para combater os efeitos presentes e esperados das mudanças climáticas estariam relacionados à integração ao mercado. Nas últimas décadas, comunidades tradicionais vêm discutindo entre si e com outros agentes (e.g., governo, pesquisadores, organizações não-governamentais) sobre os efeitos das mudanças climáticas, assim como possíveis estratégias de mitigação e adaptação (Bele, Tiani, et al., 2013). A mitigação consiste em reduzir as fontes de emissão de gases de efeito estufa por atividades humanas (Ipcc, 2014c), sendo considerada uma estratégia de longo prazo (Negi et al., 2017). Já a adaptação consiste em ajustes aos impactos das mudanças climáticas, esperadas ou reais, implementadas por indivíduos, empresas privadas ou governo, com o objetivo de conter e evitar danos, ou aproveitar potenciais benefícios (Ipcc, 2014d), tendo efeitos mais imediatos (Negi et al., 2017).A literatura apresenta três formas mais comuns em que sociedades tradicionais de pequena escala se adaptam às mudanças climáticas. A primeira seria diversificar ou substituir atividades, produtos e estratégias, como: (i) alterar o tipo de recursos que dependem, como mudanças nos produtos cultivados (Negi et al.,2017) (e.g., adotar plantas de crescimento mais rápido) (Boissière et al., 2013) ou no tipo de animais caçados (e.g., (Willox et al., 2015); (ii)investimento na criação de animais domésticos (e.g., gado, galinhas) para diversificar a subsistência e ter uma reserva financeira para momentos de crise (Mapfumo et al., 2016); (iii) adotar inovações técnicas (e.g., aceiros para conter fogo) (Bele, Tiani, et al., 2013; Rahman et al., 2018) ou tecnológicas (e.g., culturas híbridas) (Waldman e Richardson, 2018). Segundo, integrar-se ao mercado, por meio: (i) da substituição de produtos(e.g., alimentos) por aqueles comprados (Hofmeijer et al., 2013; Ruiz-Mallén et al., 2017); (ii) adoção de atividades que geram renda monetária (e.g.,(Ingty, 2017), ou (iii) receber ajuda de instituições de mercado, organizações governamentais ou não-governamentais (Rahman et al., 2018).Terceiro, alterar a localização espacial e altitudinal das atividades, como aquelas agrícolas (Boillat e Berkes, 2013), ou da própria residência,migrando ou deslocando-se temporariamente para outras regiões (Hofmeijer et al., 2013; Negi et al., 2017).Espera-se que os Ksêdjê esteja mutilizando os recursos monetários como as transferências do governo e da venda de PFNM e, portanto, integração ao mercado, como estratégia para: (i) consumo de alimentos para suprir a falta dos recursos provenientes da caça, pesca, coleta e agricultura; (ii) diversificar as atividades econômicas e com isso, melhorar a proteção contra possíveis choques advindos das mudanças climáticas (Macours et al., 2012), utilizando o dinheiro para investir em cursos que os auxiliem a enfrentar possíveis efeitos das mudanças, e.g., de combate ao fogo, ou em produtos, e.g., mudas de sementes para diversificar

os produtos da roça ou da floresta, auxiliando as famíliasa gerenciar melhor os riscos (Wood, 2011) e a combater o desmatamento (Pramova et al., 2012), dentro e no entorno da Terra Indígena.

HIPÓTESE

Hipótese 1. As mudanças climáticas previstas e em curso estariam causando mais efeitos negativos do que positivos às atividades de subsistência praticadas pelos Ksêdjê e, com isso, aumentando a dependência de produtos comprados nas cidades. Esses efeitos seriam maiores para a agricultura e para a pesca, mas menores para a coleta. Portanto, os Ksêdjê estariam investimento menos tempo na agricultura e pesca, e mais tempo na coleta. Hipótese 2. Os efeitos das mudanças climáticas devem ser mediados pelo comportamento das pessoas frente ao risco. Partindo da teoria do prospecto, os Kisêdjê considerariam as perdas e os ganhos da escolha na tomada de decisão, sendo influenciados por emoções, limitações cognitivas ou pelo contexto. Esse comportamento variaria entre homens e mulheres, segundo diferentes faixas etárias, sendo que oshomens mais jovens seriam mais buscadores de risco do que as mulheres mais jovens e as pessoas mais velhas. Hipótese 3. As principais estratégias de adaptação já adotadas ou que os Ksêdjê pretendem adotar para combater os efeitos presentes e esperados das mudanças climáticas estariam relacionados à integração ao mercado.

METODOLOGIA

Este estudo será realizado na Terra Indígena (T.I.) Wawi, estado de Mato Grosso, com o povo indígena Ksêdjê. O estudo será realizado em cinco passos. 1) Serão identificadas quais mudanças associadas ao clima já ocorrem ou são previstas para a região do Xingu e na T. I. Wawi, bem como sua sinergia com outros vetores de alterações na paisagem. Será realizada uma revisão não sistemática da literatura científica e de dados secundários. 2) Com essas informações, se investigará as percepções dos Ksêdjê sobre mudanças, efeitos prováveis e possíveis estratégias de adaptação, em levantamento com duas fases. A primeira será qualitativa por meio de scenario planning. Baseado em grupos de discussão (homens ou mulheres), o método consiste em identificar problemas, vulnerabilidades e mudanças, assim como avaliar cenários futuros e, em certos casos, propor adaptações (Bennett et al., 2016). Permite esboçar situações futuras que precisam de respostas imediatas ou de longo prazo, além de ajudara identificar os indicadores de um cenário em particular, assim como as respostas para essa situação. O segundo será baseado em delineamento observacional do tipo transversal (cross-sectional) (ver: Newing et al., 2011)

consistirá em um survey por entrevistas de todas unidades domésticas e indivíduos adultos (18anos) das quatro comunidades (Ngôjhwêrê, Ngôsokô, Jarumã e Horehuskro), constituindo um censo do grupo. As entrevistas serão realizadas em português, com auxílio de tradutor Ksêdjê, quando os indivíduos não entenderem português. Antes da aplicação, o conteúdo e as questões do protocolo serão pré-testados em Canarana, Mato Grosso, com indígenas ali residentes (Saunders et al., 2007). 3) Para entender os efeitos das condições climáticas e da tomada de decisão no uso do tempo para as atividades de subsistência dos Ksêdjê, adotaremos novamente um survey por entrevistas como já descrito, com um delineamento observacional do tipo painel, i.e. quando as informações das mesmas unidades amostrais são coletadas em momentos diferentes do tempo (Newing et al., 2011), em nosso caso, diferentes estações do ano. A coleta será por observação direta de alocação de tempo pela técnica random-interval instantaneous sampling, a qual consiste em registrar o comportamento das pessoas no momento em que são observadas (Gross, 1984; Johnson e Sackett, 1998), em dias e horários selecionados aleatoriamente (Johnson,1975; Johnson e Sackett, 1998). Assim, serão sorteados horários entre 7:00 e 18:00 e a primeira casa que será visitada e, em ordem crescente das casas, as atividades realizadas nos horários designados serão registradas.4) Para entender como os Ksêdjê se comportam para lidar com vulnerabilidades e situações de risco, assim como quais teorias de risco (teoria de escolha racional ou teoria do prospecto), melhor explicam seu comportamento, serão combinados dados de survey por entrevista já descritos, para entender a percepção dos Ksêdjê quanto ao risco, a quase experimentos baseados em cenários (experimental vignettes), para testar o comportamento efetivo: (i) frente a diferentes cenários de riscos enfrentados ou previstos com as mudanças climáticas e (ii) segundo idade e gênero (e.g. se homens seriam buscadores e mulheres avessas ao risco). Experimental vignettes consistem em apresentar aos participantes como “intervenção” atribuída aleatoriamente, cenários ou situações previamente construídas em forma de texto, imagens ou vídeos (Aguinis e Bradley, 2014). 5) Para identificar e descrever quais estratégias de adaptação e mitigação são utilizadas ou propostas pelos Ksêdjê para mitigar os efeitos das mudanças climáticas, assim como suas vantagens e desvantagens, os dados virão do survey por entrevistas, como já descrito. Também serão reaplicados e utilizados os dados obtidos do survey de renda em 2016 e 2017, para avaliar como o dinheiro proveniente do Programa Bolsa Família e outras rendas monetárias é utilizado.

Objetivo da Pesquisa:

OBJETIVO PRIMÁRIO

As evidências acima mostram que os povos indígenas, como aqueles amazônicos, são sociedades que, dada sua vulnerabilidade, serão possivelmente afetadas severamente por problemas causados pelas mudanças climáticas globais. Esses efeitos, por sua vez, dependem principalmente de três fatores. Primeiro, de como as mudanças climáticas, de maneira individual, afetarão os territórios indígenas, mas também da sinergia destas com outros vetores de transformação de uso do solo que afetam a região. Segundo, de como essas mudanças interagem com a forma como os indígenas realizam as atividades de subsistência, o que é influenciado não somente por fatores climáticos, mas também pelo processo de tomada de decisão das pessoas. Em particular, essas decisões dependem (i) da forma como as pessoas escolhem quais atividades realizarão e (ii) do comportamento das pessoas frente ao risco. Por fim, a dimensão dos efeitos depende também de possíveis estratégias de adaptação adotadas pelos indígenas e de políticas públicas que contemplem a especificidade cultural e os projetos de vida de cada povo. Baseando-se neste contexto, este projeto tem como objetivo central: avaliar os efeitos das mudanças climáticas sobre povos indígenas do Xingu, em particularos Ksêdjê, e suas estratégias de adaptação.

OBJETIVOS SECUNDÁRIOS
Os objetivos específicos são quatro, conforme a seguir. i) Identificar e descrever quais mudanças associadas ao clima são previstas e já ocorrem para a região do Xingu e seus territórios indígenas, em particular a Terra Indígena Wawi.ii) Identificar quais são os impactos negativos dessas mudanças nas atividades de subsistência (i.e., agricultura, coleta, pesca e caça), segundo: (a) a percepção do povo indígena Ksêdjê, (b) os efeitos das condições climáticas e da tomada de decisão no uso do tempo para as diferentes atividades de subsistência praticadas pelos Ksêdjê; iii)Entender como os Ksêdjê se comportam para lidar com vulnerabilidades e situações de risco, e quais teorias de risco melhor explicariam seu comportamento e, por fim,iv) Identificar e descrever quais são as estratégias de adaptação utilizadas e propostas pelos Ksêdjê para combater as mudanças climáticas, suas vantagens e desvantagens.

Avaliação dos Riscos e Benefícios:
RISCOS
Principal risco identificado é o incômodo que membros da comunidade podem sentir em responder às perguntas nas entrevistas, ou em serem observados, mas para evitar constrangimentos, apenas aqueles que concordarem com a participação serão incorporados na pesquisa. O tempo gasto com as entrevistas também implica que não poderão estar envolvidos

com outras atividades.

BENEFÍCIOS
O estudo pode auxiliar a entender os efeitos negativos e positivos das mudanças climáticas sobre as atividades de subsistência e modos de vida de povos indígenas amazônicos, além de auxiliá-los com estratégias de adaptação à essas mudanças. Os trabalhos desenvolvidos no Brasil, partícularmente na Amazônia, têm dado ênfase ao REDD+ como medida para combater as mudanças climáticas (Ricketts et al., 2010; Nogueira e tal., 2018), mas pode ser que outras estratégias também sejam eficientes. Portanto, é necessário entender a percepção dos povos indígenas sobreas mudanças e seus impactos, quais as estratégias de adaptação podem ser adotadas, e como conciliar essas estratégias ao conhecimento tradicional deles, para que eles possam junto com outros agentes (inclusive o governo), minimizar possíveis efeitos negativos e manter e ou potencializar os positivos. As estratégias adotadas podem servir de inspiração para futuras ações políticas para povos indígenas no Brasil e no mundo, para incentivar pesquisas com essas populações, além do investimento em mais estações meteorológicas para melhor monitoramento e avanço nas previsões de possíveis cenários futuros.

Comentários e Considerações sobre a Pesquisa:
Este projeto objetiva cumprir etapa para conclusão de pós-graduação no curso de Ciência Ambiental - PROCAM da Universidade de São Paulo - USP. O projeto de pesquisa tem a finalidade de avaliar os efeitos das mudanças climáticas sobre povos indígenas do Xingu, e suas estratégias de adaptação. A população indígena pesquisada está na Terra Indígena Wawi, Estado de Mato Grosso. O povo indígena Ksêdjê, com cinco comunidades Ksêdjê (Ngôjhwêrê, Khikhatxi, Ngôsokô, Jarumã e Horehuskro) participarão do projeto em tela.

Considerações sobre os Termos de apresentação obrigatória:
Vide campo "Conclusões ou Pendências e Lista de Inadequações".

Recomendações:
Não se aplica.

Conclusões ou Pendências e Lista de Inadequações:
Análise de respostas ao parecer pendente nº 2.942.690 emitido pela Conep em 17/09/2018:

1. Considerando que é um projeto na área de Ciências Humanas e Sociais, com população

indígena, recomenda-se cumprimento à Resolução CNS nº 510 de 2016 (Normas aplicáveis a pesquisas em Ciências Humanas e Sociais) e à Resolução CNS nº 304 de 2000 (Pesquisa com População Indígena), especialmente nas declarações e TCLE.
RESPOSTA: Esclareço que tenho conhecimento e estou cumprindo o que consta na Resolução CNS nº 510 e nº 304. Respeito o direito dos povos indígenas, assim como sua visão de mundo, os costumes, atitudes estéticas, crenças religiosas, organização social, filosofias peculiares, diferenças linguísticas e estrutura política. Não permitirei em nenhum momento que haja exploração física, mental, psicológica ou intelectual e social dos indígenas; e não admitirei situações que coloquem em risco a integridade e o bem estar físico, mental e social de qualquer indígena. Complemento que neste estudo não haverá ensaios clínicos, informações farmacológicas, toxicológicas e nem o uso de medicamentos em animais e/ou seres humanos. Submeto novamente o TCLE e juntamente o Termo de Assentimento, conforme recomendações deste parecer.
ANÁLISE: PENDÊNCIA ATENDIDA

2. Em comunidades cuja cultura grupal reconheça a autoridade do líder ou do coletivo sobre o indivíduo, a obtenção da autorização para a pesquisa deve respeitar tal particularidade, sem prejuízo do consentimento individual, quando possível e desejável. Dessa forma, solicita-se apresentar autorização das lideranças ou, caso seja inviável sua apresentação no momento, declaração do (a) pesquisador (a) que esse será obtida antes do início da pesquisa.
RESPOSTA: Informo que obtive autorização da liderança do povo indígena Ksêdjê, o cacique Kuiussi Suyá. Esta autorização já foi enviada à Funai (Processo nº 08620.013202018-41) em outubro de 2018. Anexo o documento submetido na Funai “AutorizacaoKuiussi_LiaTaruiapTroncarelli.pdf”.
ANÁLISE: PENDÊNCIA ATENDIDA

3. Quanto ao documento “PB_INFORMAÇÕES_BÁSICAS_DO_PROJETO__1194832.pdf” (gerado no dia 03/09/2018, na Plataforma Brasil), lê-se na página 6 de 9: “Haverá uso de fontes secundárias de dados (prontuários, dados demográficos, etc.)? Não”, porém neste mesmo arquivo existe previsão de que “[...] Será realizada uma revisão não sistemática da literatura científica e de dados secundários.” Solicitam-se esclarecimentos sobre o uso ou não de fontes secundárias, com a devida adequação nos documentos do protocolo, caso seja pertinente.
RESPOSTA: Esclareço que serão utilizados dados secundários quando pertinente, e que o que

consta na Plataforma Brasil foi arrumado.
ANÁLISE: PENDÊNCIA ATENDIDA

4. Quanto ao arquivo, “TermoConsentimento_LiaTaruiapTroncarelli.docx”, submetido à Plataforma Brasil em 06/08/2018, seguem as seguintes considerações:

4.1 A Resolução CNS nº 510/2016, Artigo 2º, Inciso XXV, define risco da pesquisa como “a possibilidade de danos à dimensão física, psíquica, moral, intelectual, social, cultural do ser humano, em qualquer etapa da pesquisa e dela decorrente”. Dessa forma, solicita-se que os RISCOS DA PESQUISA sejam expressos de forma clara no Registro de Consentimento Livre e Esclarecido e demais documentos, bem como a apresentação das providências e cautelas a serem empregadas para evitar e/ou reduzir efeitos e condições que possam vir a causar algum dano ao participante de pesquisa.
RESPOSTA: O Termo de Consentimento e o Termo de Assentimento foram arrumados, e foi inserido um parágrafo sobre os riscos aos participantes. Os documentos constam no anexo “TermoAssentimento_LiaTaruiapTroncarelli” e “TermoConsentimento_LiaTaruiapTroncarelli”.
ANÁLISE: PENDÊNCIA ATENDIDA

4.2. O etnoconhecimento botânico referente aos aspectos ecológicos é parte do patrimônio cultural e da propriedade intelectual da população estudada. Conforme o disposto pela resolução CNS n° 304 de 2000, item III.2, qualquer pesquisa envolvendo a pessoa do índio ou a sua comunidade deve: "2.1 - Respeitar a visão de mundo, os costumes, atitudes estéticas, crenças religiosas, organização social, filosofias peculiares, diferenças linguísticas e estrutura política". Solicita-se, assim, uma declaração de compromisso do (a) pesquisador (a) de não patentear, nem usar para fins comerciais, o conhecimento botânico, bem como o conhecimento tradicional adquirido em campo e catalogado, e que esse será utilizado somente conforme os objetivos propostos pela pesquisa, conforme o consentimento da comunidade e que a pesquisa será realizada em conformidade com a lei 13.123/15.
RESPOSTA: Informo que estou de acordo com o que consta neste item, e que me comprometo a seguir esta Declaração de Compromisso, conforme documento anexado “Declaracao_ParecerCONEP_LiaTaruiapTroncarelli.pdf”.
ANÁLISE: PENDÊNCIA ATENDIDA

4.3. No documento apresentado lê-se: "se for tirada uma foto sua, ela será mostrada a você, e só será usada na pesquisa se você quiser e aceitar", considerando que não está prevista nos demais documentos do protocolo a utilização de recursos de gravação de áudio e/ou vídeo, solicitam-se esclarecimentos e ou adequação do trecho. Ademais, deve-se ter em conta que havendo previsão de registro de imagem, solicitasse incluir opções excludentes: “sim, eu autorizo” e “não, eu não autorizo”, no registro de consentimento livre e esclarecido, já que estes dados somente podem ser utilizados com o consentimento prévio e anuência dos participantes, para a finalidade exclusiva da pesquisa e sem fins lucrativos, devendo ser observadas a PORTARIA nº 177/PRES/06 da Funai e demais legislações pertinentes. Solicita-se adequação.
RESPOSTA: O Termo de Consentimento e de Assentimento foram arrumados, e foi retirada a parte onde se lê: "se for tirada uma foto sua, ela será mostrada a você, e só será usada na pesquisa se você quiser e aceitar", pois não serão tiradas fotos das pessoas.
ANÁLISE: PENDÊNCIA ATENDIDA

4.4. Na página 17 de 23 do Projeto Detalhado, documento Projeto_Doutorado_LiaTaruiapTroncarelli.pdf", lê-se que "as entrevistas serão realizadas em português, com auxílio de tradutor Ksêdjê, quando os indivíduos não entenderem português". Considerando a previsão de participante de pesquisa que necessite de ajuda do tradutor e que o Registro do Consentimento Livre e Esclarecido é o meio pelo qual é explicitado o consentimento livre e esclarecido do participante, sob a forma escrita, sonora, imagética, ou em outras formas que atendam às características da pesquisa e dos participantes, devendo conter informações em LINGUAGEM CLARA E DE FÁCIL ENTENDIMENTO para o suficiente esclarecimento sobre a pesquisa (Resolução CNS nº 510/2016, Artigo 15), solicitam-se esclarecimentos e/ou adequação da forma de registro utilizada para a população referida.
RESPOSTA: Esclareço que as entrevistas estarão escritas em português e serão realizadas face a face, com um tradutor que fale português e Ksêdjê. Entre o povo indígena Ksêdjê há algumas pessoas que falam e entendem a língua portuguesa. Em todo caso, o tradutor estará sempre presente, auxiliando a pesquisa, inclusive quando o TCLE ou o Termo de Assentimento forem lidos junto aos participantes da pesquisa, assim como potenciais dúvidas que os participantes tenham ao longo da pesquisa. No meu mestrado, que também foi realizado junto ao povo indígena Ksêdjê, não tive problemas quanto à essa forma de ajuda, ou seja, o pesquisador contar com o auxílio de um tradutor indígena. As entrevistas serão elaboradas em linguagem clara e de fácil entendimento.

ANÁLISE: PENDÊNCIA ATENDIDA

5. Quando à Folha de Rosto, documento intitulado "FolhadeRosto_LiaTaruiapTroncarelli_assinada.pdf" e postado na Plataforma Brasil em 03/09/2018, verifica-se que os campos referentes à instituição proponente da pesquisa não estão completamente preenchidos. Todos os campos da folha de rosto devem ser preenchidos, datados e assinados, com a identificação dos signatários. Diante do exposto, solicita-se adequação e preenchimento dos campos (Norma Operacional CNS nº 001 de 2012, item 3.3.a).
RESPOSTA: Informo que os campos “Responsável” e “CargoFunção” estão preenchidos no carimbo. O responsável é a Profa. Dra. Mônica Sanches Yassuda, e seu CargoFunção é Diretora. O documento foi arrumado e segue novamente em anexo “FolhadeRosto_LiaTaruiapTroncarelli_assinada_1.pdf”.
ANÁLISE: PENDÊNCIA ATENDIDA

Considerações Finais a critério da CONEP:
Diante do exposto, a Comissão Nacional de Ética em Pesquisa - Conep, de acordo com as atribuições definidas na Resolução CNS nº 466 de 2012 e na Norma Operacional nº 001 de 2013 do CNS, manifesta-se pela aprovação do projeto de pesquisa proposto.

Situação: Protocolo aprovado.

Este parecer foi elaborado baseado nos documentos abaixo relacionados:

Tipo Documento	Arquivo	Postagem	Autor	Situação
Informações Básicas do Projeto	PB_INFORMAÇÕES_BÁSICAS_DO_PROJETO_1194832.pdf	13/11/2018 14:01:07		Aceito
Folha de Rosto	FolhadeRosto_LiaTaruiapTroncarelli_assinada_2.pdf	13/11/2018 14:00:46	LIA TARUIAP TRONCARELLI	Aceito
Outros	CartaResposta_ParecerCONEP_LiaTaruiapTroncarelli.pdf	12/11/2018 13:40:27	LIA TARUIAP TRONCARELLI	Aceito
TCLE / Termos de Assentimento / Justificativa de Ausência	TermoAssentimento_LiaTaruiapTroncarelli_versaolimpa.docx	12/11/2018 13:39:39	LIA TARUIAP TRONCARELLI	Aceito
TCLE / Termos de Assentimento /	TermoConsentimento_LiaTaruiapTroncarelli_versaolimpa.docx	12/11/2018 13:39:29	LIA TARUIAP TRONCARELLI	Aceito

Justificativa de Ausência	TermoConsentimento_LiaTaruiapTroncarelli_versaolimpa.docx	12/11/2018 13:39:29	LIA TARUIAP TRONCARELLI	Aceito
Outros	AutorizacaoKuiussi_LiaTaruiapTroncarelli.PDF	05/11/2018 12:55:42	LIA TARUIAP TRONCARELLI	Aceito
TCLE / Termos de Assentimento / Justificativa de Ausência	TermoConsentimento_LiaTaruiapTroncarelli.docx	05/11/2018 12:55:09	LIA TARUIAP TRONCARELLI	Aceito
TCLE / Termos de Assentimento / Justificativa de Ausência	TermoAssentimento_LiaTaruiapTroncarelli.docx	05/11/2018 12:55:00	LIA TARUIAP TRONCARELLI	Aceito
Declaração de Pesquisadores	Declaracao_ParecerCONEP_LiaTaruiapTroncarelli.pdf	05/11/2018 10:55:34	LIA TARUIAP TRONCARELLI	Aceito
Outros	CartaProtocolo_Pesquisa_EACH_USP_LiaTaruiapTroncarelli.pdf	10/08/2018 08:48:04	LIA TARUIAP TRONCARELLI	Aceito
Orçamento	Orcamento_LiaTaruiapTroncarelli.docx	06/08/2018 17:00:52	LIA TARUIAP TRONCARELLI	Aceito
Projeto Detalhado / Brochura Investigador	Projeto_Doutorado_LiaTaruiapTroncarelli.pdf	06/08/2018 16:45:18	LIA TARUIAP TRONCARELLI	Aceito
Cronograma	Cronograma_LiaTaruiapTroncarelli.docx	06/08/2018 16:22:35	LIA TARUIAP TRONCARELLI	Aceito

Situação do Parecer:
Aprovado

BRASILIA, 05 de Dezembro de 2018

Assinado por:
Jorge Alves de Almeida Venancio
(Coordenador(a))

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